7.0 AQUIFER MANAGEMENT PLAN

This section presents the aquifer management plan for operation of the Colbert Landfill RA. This section provides an explanation of aquifer conditions, the aquifer hydraulic controls needed to meet the project consent decree requirements, the recommended initial operational settings, and the recommended approach to evaluating system performance and implementing system adjustments.

7.1 SUMMARY OF HYDROGEOLOGIC CONDITIONS AND THE EXTENT OF CONTAMINATION

7.1.1 HYDROGEOLOGIC CONDITIONS

The hydrogeologic system in the vicinity of the landfill contains four aquifers (two primary and two secondary) and three aquitards:

- The Upper Sand/Gravel Unit (Unit A) forms the Upper Sand/Gravel Aquifer when underlain by the Lacustrine Unit (Unit B), and is considered a primary aquifer.

- The Lacustrine Unit (Unit B) is the low-permeability unit that separates the Upper Sand/Gravel Unit from the Lower Sand/Gravel Unit and is referred to as the Lacustrine Aquitard. However, the Lacustrine Aquitard contains interbedded, saturated sand layers that appear to be hydraulically connected with the Upper Sand/Gravel Aquifer.

- The Lower Sand/Gravel Unit (Unit C) forms the Lower Sand/Gravel Aquifer, which is a primary aquifer, as well as the regional aquifer for the site.

- The Latah Formation (Unit D), and the Weathered Latah Subunit (Unit D_1), serve as the aquitard underlying the Lower Sand/Gravel Aquifer at most locations and (in combination) are referred to as the Latah Aquitard. However, some low-yield private wells are installed in the Latah Aquitard east of the landfill, where the Upper and Lower Sand/Gravel Aquifers are not present.

- The Basalt Unit (Unit E) forms a secondary aquifer interbedded with the Latah Aquitard and is referred to as the Basalt Aquifer.

- The Granite Unit (Unit F) serves as the lower boundary (aquitard) to the regional flow system, although some low-productivity wells are installed in the upper portion of this unit.

- The Fluvial Unit associated with the Little Spokane River forms the Fluvial (secondary) Aquifer. The Fluvial Aquifer receives recharge from the Upper Sand/Gravel Aquifer.

Units C, D, E, and F are collectively referred to as the "Lower Aquifers" for evaluating regional groundwater flow and contaminant distribution, although the Lower Sand/Gravel Aquifer (Unit C) appears to be the only one of these units capable of sustained yield at high discharge rates.

The Upper Sand/Gravel Aquifer is unconfined, with a depth to water about 90 ft below ground surface in the landfill vicinity. The thickness of the Upper Sand/Gravel Aquifer varies from about 8-20 ft along its north-south trending centerline and decreases as it extends toward the western bluff and eastern hills. Upper Sand/Gravel Aquifer groundwater flow is predominantly toward the south with velocities ranging from 5-7 ft/day (Landau Associates 1991). A groundwater elevation contour map for the Upper Sand/Gravel Aquifer is shown on Figure 7-1.

The Lower Sand/Gravel Aquifer is generally confined west of the landfill and unconfined from the west landfill boundary to the east. The potentiometric surface of the Lower Sand/Gravel Aquifer is about 180 ft below ground surface, and saturated thickness varies from 0 ft east of the landfill to over 200 ft near U.S. Highway 2. Groundwater in the Lower Sand/Gravel Aquifer flows predominantly toward the west at velocities ranging from 0.3 to 0.6 ft/day (Landau Associates 1991).

East of the Lower Sand/Gravel Aquifer, groundwater flow occurs primarily as perched groundwater at the Lower Sand/Gravel Unit interface with the underlying Latah Aquitard and within the Basalt (secondary) Aquifer, although some domestic wells are screened within the Latah and Granite Aquitards. A groundwater elevation contour map for the combined Lower Aquifers is shown on Figure 7-2.

Sections 4.1 and 4.2 of the Phase I Engineering Report (Landau Associates 1991) should be reviewed for a more thorough discussion of Project hydrogeologic conditions.

7.1.2 CONSTITUENT DISTRIBUTION

The Upper Sand/Gravel Aquifer, Fluvial Aquifer, and shallow sand interbeds of the Lacustrine Aquitard are collectively referred to as the Upper Aquifers for assessing the distribution of Constituents of Concern in groundwater. The Lower Sand/Gravel Aquifer, Basalt Aquifer, Latah Aquitard, and Granite Aquitard are similarly referred to as the Lower Aquifers for constituent

distribution evaluation. Figures 7-3 and 7-4 show the distribution of the TCA (the most widely distributed Constituent of Concern) for the Upper and Lower Aquifers, respectively. These figures are based on a supplemental groundwater sampling event conducted by Spokane County in March 1995 and represent the areal extent over which TCA (or one of the other Constituents of Concern) was detected and the area over which TCA (or one of the other Constituents of Concern) exceeded the Performance Standards.

Section 4.3 of the Phase I Engineering Report (Landau Associates 1991) should be reviewed for a more thorough discussion of project water quality conditions.

7.2 INTERCEPTION/EXTRACTION SYSTEM DESIGN

The Phase II South and West Interception Systems design included determining the spacing and discharge rates of extraction wells required to create an effective hydraulic barrier to groundwater contaminant migration in the Upper and Lower Sand/Gravel Aquifers, respectively. East Extraction System design included selecting the location and discharge rates of extraction wells to provide effective groundwater extraction for source control in the Lower Sand/Gravel and Basalt Aquifers.

7.2.1 DESIGN METHOD

Because of the complex hydrogeologic conditions present in the landfill vicinity [see Sections 4.1 and 4.2 of the Phase I Engineering Report (Landau Associates 1991) for a detailed discussion of hydrogeologic conditions], analytical analyses were considered inadequate for South and West Interception System design. MODFLOW (McDonald and Harbaugh 1988), a finite-difference numerical groundwater flow model developed by the U.S. Geological Survey, was utilized to develop separate groundwater flow models for the Upper and Lower Sand/Gravel Aquifers for interception and extraction system design.

Following development of the steady-state (nonpumping) groundwater flow models, extraction well locations were selected for the South and West Interception Systems and the East Extraction System (Figure 7-5).

The capture zones for the interception/extraction systems were estimated using a program that simulated the release of a series of particles upgradient of the extraction wells and perpendicular

to the direction of groundwater flow. Each capture zone was estimated as the zone within which particles are captured by the extraction wells. The well spacing and/or pumping rates were adjusted until the zone of capture for the system was adequate and particles did not escape the system between adjacent extraction wells.

Four extraction wells were required for the South Interception System to achieve adequate plume capture, based on the capture zone analysis previously described and hydrogeologic conditions encountered during Phase II well construction. Model-predicted system pumping rates vary from about 200 gpm to 230 gpm. The model-predicted capture zone for the South Interception System is shown on Figure 7-6, and is based on the upper bound pumping rate of 230 gpm. Estimates of individual and system flow rates are provided in Table 7-1. Estimated prepumping water elevation, minimum water elevation, well drawdown, and available drawdown are provided in Table 7-2.

Because of their interaction, contaminant capture zones for the West Interception and East Extraction Systems were evaluated as a single system. The West Interception and the East Extraction Systems each include three extraction wells, although only two of the East Extraction wells are screened in the Lower Sand/Gravel Aquifer (Extraction Well CP-E2 is screened in the Basalt Aquifer). Model-predicted pumping rates required to obtain capture within the portion of the Lower Sand/Gravel Aquifer impacted by the Constituents of Concern are estimated to vary from about 435 gpm to 745 gpm for the combined flow of the West Interception and East Extraction Systems. The model-predicted capture zone for the West Interception and East Extraction Systems is shown on Figure 7-7, and is based on the estimated upper bound pumping rate of about 745 gpm. Estimates of individual well and system pumping rates are provided in Table 7-1. Estimated extraction well prepumping water elevation, well drawdown, minimum water elevation, and available drawdown are presented in Table 7-2.

7.2.2 REGIONAL DRAWDOWN

Operation of the Phase II Interception and Extraction Systems will result in aquifer drawdown (i.e., lowering the water table or piezometric surface) over a large (regional) area. This regional drawdown has the potential to impact available drawdown for private wells in the vicinity of the RA.

Drawdowns for the Upper and Lower Sand/Gravel Aquifers were estimated using the MODFLOW groundwater flow models developed for interception/extraction system design. Model-estimated regional drawdown resulting from Phase II operation for the Upper and Lower Sand/Gravel Aquifers is presented on Figures 7-8 and 7-9, respectively. Although these estimated drawdowns provide a reasonable approximation of anticipated values, the accuracy of these estimates may decrease as the model boundaries are approached; it is anticipated that observed drawdowns may exceed the predicted values near the model boundaries.

7.3 CONSENT DECREE REQUIREMENTS

The project consent decree specifies the groundwater quality criteria that must be achieved during operation, and to demonstrate completion, of the RA. The consent decree also contains criteria identifying the concentrations at which the need for adjustment or modification of the RA interception/extraction system must be evaluated, as well as providing for reduction in operation requirements if certain conditions are achieved for a specified period of time. These criteria, developed for the Constituents of Concern, are concentration-based and include the project performance standards, evaluation criteria, and operational and adjustment control criteria, defined below.

7.3.1 CONSENT DECREE PERFORMANCE STANDARDS AND EVALUATION CRITERIA

The performance standards are the health-based criteria that must be achieved throughout the aquifers to demonstrate that the RA is complete. The evaluation criteria are the same as the performance standards, except that the criteria for PCE and methylene chloride are higher to address the difficulty in quantifying these constituents at their performance standard concentrations. The evaluation criteria are the criteria specified in the consent decree as the direct or indirect bases for

evaluating performance of the RA interception/extraction system during operation. The performance standards and evaluation criteria are shown in Table 7-3.

7.3.2 CONSENT DECREE OPERATIONAL AND ADJUSTMENT CONTROL CRITERIA

It is recognized in the consent decree that the interception systems may not achieve 100 percent capture. However, the regulatory agencies did not consider the exceedence of project performance standards in downgradient compliance monitoring wells adequately conservative criteria to trigger adjustment or modification to the interception systems. As a result, operational and adjustment control criteria were specified as the basis for adjusting or modifying the interception systems, if these criteria are exceeded in downgradient compliance monitoring wells.

The project consent decree specifies that operational and adjustment control criteria be developed, and once developed, requires that the South and West interception systems be adjusted or modified if these criteria are not achieved in selected downgradient compliance monitoring wells.

Operational and adjustment control criteria are defined in the Consent Decree as follows:

> **Operational Control Criteria:** the chemical criteria that, if exceeded, requires adjustment to the existing interception system. Adjustment may include increasing pumping rates or other adjustments to the existing system to improve interception system efficiency.
>
> **Adjustment Control Criteria:** the chemical criteria that, if exceeded, requires modification to the existing interception system. Modifications may include increasing pumping rates, adding extraction wells to the system, or other methods of correcting interception system deficiencies.

Operational control criteria only apply to TCA and DCA, and only apply to the South Interception System and the portion of the West Interception System that is monitored by the Set A monitoring wells (per Section V.C.2.b of the Consent Decree scope of work). The consent decree specifies that the operational control criteria will be equal to the lesser of 30 percent of the evaluation criteria for TCA and DCA, or 15 percent of the evaluation criteria plus the baseline groundwater concentration (whichever is less).

Adjustment control criteria apply to the indicator compounds specified in the Consent Decree (TCA, DCA, DCE, and TCE) for the South and West Interception Systems. The Consent Decree specifies that the adjustment control criteria will be equal to 65 percent of the evaluation criteria for

the indicator compounds, or 50 percent of the evaluation criteria plus the baseline groundwater concentration (whichever is less)

Operational and adjustment control criteria were calculated as specified in the consent decree, and are presented in Tables 7-8 and 7-9 for the Upper and Lower Sand/Gravel Aquifers, respectively. In all instances, the operational control criteria were calculated as 15 percent of the evaluation criteria, plus the baseline concentration or PQL (as applicable). The adjustment control criteria were calculated as 50 percent of the evaluation criteria, plus the baseline concentration or PQL (as applicable), for TCA, DCA, and DCE. The adjustment control criterion for TCE was calculated as 65 percent of the evaluation criterion.

In all instances, the baseline concentration was greater than the PQL for TCA and the PQL was greater than the baseline concentration for all other indicator compounds (DCA, DCE, and TCE). The PQL was that for EPA Method 8010, as presented in Ecology guidance (Ecology 1995).

For the purposes of this O&M plan, the operator should compare analytical results to the operational and adjustment control criteria. Exceedence of any concentration-based criteria for compliance monitoring wells (i.e., operational or adjustment control criteria) should be identified to the Spokane County project manager for evaluation of appropriate action. Operator-initiated adjustments to the interception/extraction system should be limited to those adjustments described in Section 7.4.2.

The following section presents the development of the baseline groundwater concentrations used for development of operational and adjustment control criteria.

7.3.3 Development of Baseline Groundwater Concentrations

As discussed in the previous section, the Consent Decree requires that baseline groundwater concentrations be determined for performance monitoring wells downgradient of the South and West Interception Systems.

The baseline groundwater concentrations provide a mechanism for incorporating the groundwater quality conditions in the vicinity of the performance monitoring wells into the development of the operational and adjustment control criteria. The consent decree specifies that the baseline groundwater concentration for applicable indicator compounds is equal to average of the time-averaged concentrations after the data associated with any gradual changes following

system start up are eliminated (Consent Decree scope of work Sections V.A.2.b and V.C.2.b). The consent decree further states that if the resulting baseline concentration is below the practical quantitation limit (PQL), the PQL will be used as the baseline concentration.

All performance monitoring wells were used in determining baseline concentrations. Monitoring wells CD-31, CD-36, CD-37, and CD-38 were used in determining baseline groundwater concentrations for the Upper Sand/Gravel Aquifer. The three monitoring wells at each of the six West System performance monitoring locations (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48) were used in determining baseline groundwater concentrations for the Lower Sand/Gravel Aquifer. Monitoring well locations are shown on Figure 7-5.

Baseline groundwater concentrations were developed using the approximately 2 years of monthly groundwater monitoring data collected between June 1994 and April 1996, subsequent to RA system start up in June 1994. These data for the RA downgradient compliance monitoring wells are presented in Tables 7-4 through 7-7 for TCA, DCA, DCE, and TCE (the Consent Decree indicator compounds). As illustrated by these data, none of the indicator compounds were detected in 8 of the 22 downgradient compliance monitoring wells.

Other than detections of DCE and DCA in samples collected from CD-37A1 during the first year of post-RA start up monitoring, TCA is the only Constituent of Concern detected in any downgradient compliance monitoring well on more than one occasion. TCA data for the 2-year monitoring period are plotted on Figures 7-10 through 7-12 for all downgradient compliance monitoring wells in which TCA was detected.

Post-RA start up groundwater quality data were qualitatively inspected for trends in concentrations indicative of short-term conditions following system start up that should not be incorporated into the baseline concentration calculations (per the Consent Decree). TCA data for CD-37A1 (June 1994 through May 1995) and CD-42C2 (June 1994 through March 1995) were excluded from baseline concentration calculations because of short-term concentration trends. Also excluded were DCA data (June 1994 through June 1995) and DCE data (June 1994 through March 1995) for CD-37A1. It is important to recognize that excluding data reduces the baseline concentration, which results in operational and adjustment control criteria that are lower (and thus, more protective of human health and the environment).

Baseline concentrations were calculated by dividing the sum of all the applicable data by the number of data points (i.e., an arithmetic average) excluding those data eliminated because of short-term concentration trends (as previously discussed). For instances where a constituent was not detected, half the detection limit was used for baseline concentration calculations. Calculated baseline concentrations for the indicator compounds are presented in Tables 7-8 and 7-9 for the Upper and Lower Sand/Gravel Aquifers, respectively. As specified in the consent decree, separate baseline concentrations were calculated for Set A (CD-41, CD-42, and CD-48 monitoring locations) and Set B (CD-43, CD-44, and CD-45 monitoring locations) wells.

7.3.4 CONSENT DECREE MONITORING, OPERATION, AND SHUTDOWN CRITERIA

The consent decree specifies a number of criteria that affect monitoring, operation, and shutdown of the RA. Although the decision to adjust or modify the operation of the RA based on exceedence or achievement of these criteria (as applicable) should be made by the Spokane County project manager (in conjunction with EPA and Ecology), it is important that the operator understand the decision process for these activities so that operational adjustments are consistent with the consent decree requirement. Figure 7-13 illustrates the decision logic for groundwater monitoring for the South and West Interception Systems associated with the consent decree. Figure 7-14 illustrates the decision logic for operation and shutdown of the South and West Interception Systems as specified in the consent decree.

The decision logic presented on Figures 7-13 and 7-14 is for illustrative purposes only. Many of the decisions require technical analyses, and some decisions require the concurrence of EPA and Ecology prior to implementation. As a result, the operator should not implement any of the decisions identified on Figures 7-13 and 7-14 without direction from the Spokane County project manager.

7.3.5 ACTIONS REQUIRING REGULATORY REVIEW AND APPROVAL

As described in the previous section, the Consent Decree specifies a number or requirements and optional actions for Spokane County related to monitoring, operation, and shutdown of the RA. The intent of this section is to identify those activities that require notification and (in some instances) approval of EPA and Ecology. Any condition or activity that requires notification of, or

review and approval by, EPA and Ecology requires the involvement of both regulatory agencies. Reportedly, this requirement may change in the future, and Ecology will be the only regulatory agency administering the Consent Decree. Until written notice is received from EPA and Ecology informing Spokane County of this administrative revision, Spokane County should assume that the notification and approval requirements specified in the Consent Decree are applicable.

The remainder of this section identifies the activities that require the review and approval of EPA and Ecology, and activities that require prior notification of EPA and Ecology (but not approval). These activities and conditions are presented by system (South, East, and West), consistent with the order presented in the Consent Decree.

7.3.5.1 South System

A number of operations-related activities at the South System require the review and approval of EPA and Ecology prior to implementation. Most of these activities are associated with required responses to criteria exceedences. Section V.A.2 of the Consent Decree scope of work should be reviewed for a complete discussion of the bases for decision for the South System.

Actions requiring EPA and Ecology prior review and approval for the South System consist of:

- Determination of whether continued sampling and analysis of downgradient and outboard performance monitoring wells is needed if no exceedences of operational control criteria occur in the first five years of monitoring

- A monitoring program to address a confirmed exceedence of operational or adjustment control criteria (based on average concentration in South System performance monitoring wells), or an exceedence of the Evaluation Criteria (based on an individual well basis)

- A proposal for adjustment of the South System to address a confirmed exceedence of the operational control criteria

- A proposal for modification of the South System to address a confirmed exceedence of the adjustment control criteria for two consecutive quarters

- A proposal for modification of the South System to address a confirmed exceedence of the evaluation criteria in an individual downgradient performance monitoring well for two consecutive quarters

- An evaluation of the operation of the South System to address anomalous concentrations or concentration trends that are projected to lead to a long term exceedence of adjustment control criteria

- A proposal (developed at Spokane County's discretion) to accelerate cleanup by the addition of upgradient extraction wells

- Procedures for pulse pumping if implemented once constituent concentrations in extraction wells decrease to below the evaluation criteria (the decision to implement pulse pumping is at Spokane County's discretion, only the procedures are subject to review and approval by EPA and Ecology)

- Improve or adjust the treatment facility to address a discharge exceedence of the evaluation criteria.

The Consent Decree also specifies a number of actions that can be taken at Spokane County's discretion if certain conditions or criteria are met. Although these actions do not require EPA or Ecology approval, sufficient documentation to demonstrate that the applicable condition or criteria have been achieved and sufficient time for review of the documentation must be provided to the regulatory agencies prior to implementation.

Actions that require regulatory review (but not approval) for the South System are:

- Reducing of sampling and analysis frequency for South System monitoring wells from quarterly to annual following 12 consecutive quarters of results with concentrations below the operational control criteria
- Discharge of extracted groundwater without treatment for extraction wells that meet the operational control criteria for 2 consecutive quarters
- Discontinuation of operation of an extraction well that meets the adjustment control criteria
- Initiation of pulse pumping of extraction wells that meet the evaluation criteria (pulse pumping procedures require the review and approval of EPA and Ecology).

7.3.5.2 East System

The East System provides source control for the RA, and as a result, no performance monitoring is required. The lesser groundwater monitoring requirements associated with the East System (versus the South and West Systems) result in fewer criteria that must be achieved and fewer optional actions that require either the review and concurrence or the notification of EPA and Ecology. Section V.b.2 of the Consent Decree scope of work should be reviewed for a complete discussion of the bases for decisions for the East System.

Actions requiring EPA and Ecology review and approval for the East System consist of:

- Procedures for pulse pumping (pulse pumping is at Spokane County's discretion, only the procedures are subject to review and approval by EPA and Ecology)
- Discontinuation of operation of an extraction well if the well is not yielding at least 20 gpm
- Discontinuation of operation of an extraction well if operation is no longer cost effective
- Improve or adjust to the treatment facility to address a discharge exceedence of the evaluation criteria.

The Consent Decree also specifies a limited number of actions that can be taken at Spokane County's discretion if certain conditions or criteria are met. Although these actions do not require EPA or Ecology approval, sufficient documentation to demonstrate that the applicable condition or

criteria has been achieved, and sufficient time for review of the documentation, must be provided to the regulatory agencies prior to implementation.

Actions that require regulatory review (but not approval) for the East System are:

- Adding an extraction well to the lower aquifer monitoring program whose operation was discontinued due to yield or cost effectiveness considerations
- Discharging extracted groundwater without treatment for extraction wells that meet the operational control criteria for 2 consecutive quarters
- Initiating pulse pumping (pulse pumping procedures require the review and approval of EPA and Ecology).

7.3.5.3 West System

A number of operations-related activities at the West System require the review and approval of EPA and Ecology prior to implementation. Most of these activities are associated with required responses to criteria exceedences and are similar to those previously described for the South System. However, many of the criteria for the West System are less stringent than for the South System because of the lower potential to impact supply wells. Section V.C.2 of the Consent Decree scope of work should be reviewed for a complete discussion of the bases for decision for the West System.

Actions requiring EPA and Ecology prior review and approval for the West System consist of:

- A program to address a confirmed exceedence of adjustment control criteria (based on average concentrations in West System performance monitoring wells)
- A proposal for adjustment of the West Interception System to address a confirmed exceedence of the operational control criteria (applicable to Set A monitoring wells only)
- A proposal for modification of the West Interception System to address a confirmed exceedence of the adjustment control criteria for two consecutive quarters.
- A proposal for modification of the West Interception System to address a confirmed exceedence of the evaluation criteria in an individual downgradient performance monitoring well for two consecutive quarters (applicable to Set A monitoring wells only)

- Evaluate the operation of the West Interception System to address anomalous concentrations or concentration trends that are projected to lead to a long term exceedence of adjustment control criteria (applicable to Set A monitoring wells only)

- A proposal (developed at Spokane County's discretion) to accelerate cleanup by the addition of upgradient extraction wells

- Procedures for pulse pumping, if implemented once constituent concentrations in extraction wells decrease to below the evaluation criteria (the decision to implement pulse pumping is at Spokane County's discretion, only the procedures are subject to review and approval by EPA and Ecology)

- Improve or adjust the treatment facility to address a discharge exceedence of the evaluation criteria.

The Consent Decree also specifies a number of actions that can be taken at Spokane County's discretion if certain conditions or criteria are met. Although these actions do not require EPA or Ecology approval, sufficient documentation to demonstrate that the applicable condition or criteria has been achieved, and sufficient time for review of the documentation, must be provided to the regulatory agencies prior to implementation.

Actions that require regulatory review (but not approval) for the West System are:

- Determination of whether continued sampling and analysis of downgradient and outboard performance monitoring wells is needed if no exceedence of operational control criteria occur in the first five years of monitoring

- Reduction sampling and analysis frequency for West System monitoring wells from quarterly to annual following 12 consecutive quarters of results with concentrations below the adjustment control criteria

- Discharge of extracted groundwater without treatment for extraction wells that meet the operational control criteria for 2 consecutive quarters
- Discontinuation of operation of an extraction well that meets the adjustment control criteria

- Initiation of pulse pumping of extraction wells that meet the evaluation criteria (pulse pumping procedures require the review and approval of EPA and Ecology).

7.3.6 CONFIRMING AND REPORTING CRITERIA EXCEEDENCES

The Consent Decree specifies a procedure for confirming an exceedence of operational control, adjustment control or evaluation criteria. The procedure requires that follow up samples be collected after a single exceedence of an applicable criteria, and a criteria must be exceeded in three consecutive sampling rounds conducted on two week intervals to be considered a confirmed exceedence. As such, it is important for the operator to evaluate analytical data immediately upon receipt of preliminary lab results and initiate resampling as soon as possible once a criteria exceedence is identified. Subsequent sampling and analysis must be scheduled to provide three rounds of samples collected on two week intervals. However, it is important to remember that if the second round of sampling does not result in a criteria exceedence, it is not necessary to conduct the third sampling round.

The Spokane County project manager is responsible for communications with EPA and Ecology related to criteria exceedences. As a result, it is important that the operator inform the project manager immediately if analytical data indicate a potential criteria exceedence. Any criteria exceedence detected in a single well should be reported to EPA and Ecology as soon as data are reported from the laboratory, and final, validated data should be provided within two weeks of receipt of final laboratory results for each sampling round. In general, the preliminary results for the third sampling round should be available and provided to EPA and Ecology within six weeks of receipt of preliminary results for the first sampling round.

It is important to recognize that exceedence of operational or adjustment control criteria is based on average concentrations for applicable performance monitoring wells. Consequently, an exceedence of these criteria in an individual well may be indicative of a potential groundwater quality issue, but it does not necessarily indicate a criteria exceedence.

7.3.7 REGULATORY AGENCY NOTIFICATION/APPROVAL PROCESS

Section 7.3.5 identifies a number of activities specified in the Consent Decree that require either notification of, or review and approval by, EPA and Ecology. However, the Consent Decree does not specify the manner in which these interactions with the regulatory agencies are to occur. This section provides general procedures for submitting a planned action or evaluation that requires regulatory approval to EPA and Ecology, procedures to notify EPA and Ecolgoy of actions that do

not require regulatory approval, and general guidance for interim actions implemented prior to written agency concurrence.

7.3.7.1 Procedures for Actions Requiring Regulatory Approval

For actions that require the review and approval of EPA and Ecology prior to implementation, documentation beyond that required for notification will typically be required. For instance, if a confirmed exceedence of the operational control criteria occurs, Spokane County must submit a proposal for adjustment of the interception system to correct the exceedence. The proposal must:

- Identify the exceedence, and the probable cause of the exceedence
- Describe the proposed adjustment to the system
- Present an evaluation that demonstrates the adjustment is likely to correct the exceedence, along with supporting data and analysis (as needed)
- Provide procedures and a schedule for implementation of the corrective action.

The time required for review and approval by EPA and Ecology for an action requiring such involvement on the part of the regulatory agencies will depend on the complexity of the planned action and the ability of the regulatory agencies to respond in a timely manner. Most actions under the Consent Decree that require agency review and approval prior to implementation result from criteria exceedences, and as such, it is in the interests of all parties to respond expeditiously. In most instances, regulatory review within 30 days is a reasonable expectation. Written approval from EPA and Ecology should always be obtained prior to implementing any actions that are based on submittal of a written proposal or evaluation.

7.3.7.2 Procedures for Actions Requiring Regulatory Notification

EPA and Ecology must be provided sufficient notification by Spokane County for planned actions allowed under the Consent Decree to evaluate those actions for consistency with the Consent Decree requirements. For actions that do not require EPA and Ecology approval, notification must

provide sufficient information to allow the regulatory agencies to conclude that the relevant Consent Decree provision has been satisfied. Sufficient information must include, at a minimum:

- Reference to the appropriate section of the Consent Decree
- The data necessary to demonstrate that the relevant condition specified in the Consent Decree has been achieved
- A schedule for implementation of the action
- Any new procedures, or modifications to existing procedures, needed to implement or maintain the new action.

Thirty days notice for those actions not requiring EPA and Ecology approval should be sufficient for the regulatory agencies to determine whether Spokane County has correctly interpreted the Consent Decree, or to identify that additional time for review is necessary. It is desirable, but does not appear to be a requirement, for Spokane County to obtain written concurrence from EPA and Ecology for those actions allowed under the Consent Decree that do not specifically require approval.

7.3.7.3 Procedures for Interim Actions

In some instances it may be appropriate to implement interim corrective actions to expedite response (such as increasing the pumping rate for an extraction well) based on verbal discussions with EPA and Ecology. However, if interim corrective actions are implemented, confirmatory correspondence should be prepared by Spokane County to document the concurrence of the regulatory agencies. This correspondence should be followed by a written document that addresses the requirements under the Consent Decree.

7.4 OPERATIONAL CONTROL

The goals of operational control for the groundwater extraction system are to prevent further migration of the Constituents of Concern in the aquifers, to provide source control, and to minimize the impact of the RA on the beneficial use of affected aquifers. Achieving these three goals requires careful management of RA groundwater extraction rates.

7.4.1 INITIAL OPERATIONAL SETTINGS

Although the goal of the extraction system is to achieve the groundwater performance criteria described in Section 7.3.1, normal operation of the system will be based on optimizing aquifer drawdowns for effective hydraulic control and interception of contaminated groundwater. The initial operational settings for South and West Systems extraction wells were the model-predicted upper bound flow rates needed to capture the contaminated groundwater plumes, as presented in Table 7-1. Although these flow rates provided an initial setting for system operation (a starting point), a better measure of the effectiveness of the South and West Systems is whether they create sufficient drawdown to achieve hydraulic control while minimizing regional drawdown and groundwater extraction. The model-predicted drawdown (target drawdown) and approximate prepumping groundwater elevations for compliance monitoring wells, as well as other wells that will be used to evaluate RA hydraulic performance, are provided in Table 7-10. The location of these wells are shown on Figure 7-5.

7.4.2 OPERATIONAL ADJUSTMENTS

Operational adjustments may be required to optimize system performance, or to address exceedence of the concentration-based performance criteria discussed in Section 7.3. The primary operational adjustment for the interception/extraction systems will be modification of extraction well pumping rates The discussion within this section is limited to operational adjustments to optimize system performance (based on hydraulic analysis). Adjustments to address exceedence of concentration-based criteria are discussed in Section 7.6.

Prior to start up of the RA, it was intended that the target drawdowns and reference elevations presented in Table 7-10 would be used as a basis for determining whether operational adjustments were needed to optimize system performance, independent of (and in addition to) any adjustments required as a result of exceedence of the concentration-based criteria described in Section 7.3.2. The planned use of target drawdowns based on prepumping groundwater elevations as an appropriate means for evaluating the need for operational adjustments was predicated on the limited groundwater fluctuations observed in the Upper and Lower Sand/Gravel Aquifers prior to start up of the RA. Unfortunately, significant fluctuations in groundwater elevation have occurred

within and beyond the area of influence of the RA interception system as a result of higher than normal precipitation. As a result, this intended method for evaluating the need for operational adjustment is not valid, and an alternative method was required. This section describes the method recommended for evaluating the need for operational adjustment to optimize hydraulic performance.

The most direct method for evaluating hydraulic performance is the development of a groundwater elevation contour map, with associated groundwater flow lines, as shown on Figures 7-15 and 7-16 for the Upper and Lower Sand/Gravel Aquifers, respectively. Although somewhat imprecise, this type of flow line analysis allows the physical delineation of the capture zone based on where flow lines deflect toward, or away from, the extraction system. As shown on Figure 7-15, groundwater concentrations do not exceed the performance standard for TCA (or other Constituents of Concern), and the South Interception System is intercepting all groundwater where Constituents of Concern exceed the detection limit, and thus is achieving more than adequate capture. As shown on Figure 7-16, the capture zone for the Lower Sand/Gravel Aquifer extends well beyond the TCA performance standard (and the performance standards for all other Constituents of Concern) and, thus, is achieving more than adequate capture. Because performance standards are already being achieved in the Upper Sand/Gravel Aquifer, the discussion in this Section will focus primarily on operational adjustments for the Lower Sand/Gravel Aquifer.

It is recommended that flow line analysis be performed quarterly using the hydraulic data collected during the more extensive round of groundwater elevation monitoring described in Section 7.5.2. If system adjustment is required based on flow line analysis, adjustments should be made to extraction wells that most directly affect (i.e., are in the closest proximity to) the monitoring well or wells where hydraulic adjustment is desired. Adjustments may increase pumping rates (in response to high aquifer recharge rates) or decrease pumping rates (in response to low aquifer recharge during dry periods). If other considerations are equal, adjustments should be made such that more highly contaminated water is extracted. It should be recognized that when pump flow controls are set to maintain a constant drawdown, the system will automatically adjust the extraction well flow rate in response to changes in aquifer recharge, and adjustments should only be required in response to extreme (dry or wet) conditions or if "fine tuning" is required to optimize system performance.

The relationship between extraction rate and drawdown will vary depending on site specific conditions. Under ideal conditions, a linear relationship exists between pumping rate and drawdown for steady state conditions. However, steady-state conditions are rarely achieved or maintained for significant periods of time because of seasonal fluctuations in groundwater recharge. As a result, seasonal adjustments may be required to "fine tune" system performance.

Adjustment of pumping rates in response to flow line analysis will likely be an iterative process. That is, it may require three or four (sequentially smaller) adjustments to achieve the intended result. When an adjustment is made, sufficient time should be allowed prior to evaluating the effectiveness of the adjustment. Based on observed aquifer response to pumping, 2 to 4 weeks should be adequate to achieve about 90 percent of the aquifer response resulting from a change in extraction well setting for the Lower Sand/Gravel Aquifer. However, if an adjustment results in an aquifer response that is greater than intended, it may be appropriate to reduce the adjustment prior to system stabilization. The recommended procedure for implementing a system flow rate adjustment is as follows:

1. Perform a flow line analyses using groundwater elevation data collected during the quarterly supplemental round of groundwater elevation monitoring described in Section 7.5.2.

2. Determine whether a system adjustment (increased or decreased pumping rate) is needed to optimize system performance.

3. Select the magnitude and location of the adjustment. It is recommended that adjustments be made with extraction wells in level control mode, and that initial adjustments do not exceed more than about 0.5 ft in the extraction well. Adjustments should generally be made in extraction wells that are located in closest proximity to the portion of the aquifer where adjustment is desired, but consideration should also be given to extracted water quality (i.e., it is desirable to extract groundwater with high contaminant concentrations). It is also desirable, at least for initial adjustments, to only adjust one extraction well at a time so that a correlation can be developed between the adjustment of a given extraction well and aquifer response.

4. Monitor aquifer response to the adjustment. Hydraulic monitoring of four to six monitoring wells should be adequate; typically one monitoring well in the vicinity of the pumping well (if present) and three to five compliance monitoring wells. It is recommended that monitoring wells screened in the C2 zone be used for monitoring Lower Sand/Gravel Aquifer adjustments. Water level measurements should be made

immediately prior to system adjustment, about 1 day following adjustment, and then periodically until water levels stabilize.

5. Once water elevations have stabilized, collect a supplemental round of groundwater levels and perform a flow line analysis as previously described. However, the round of water level measurements can be more focused than the quarterly supplemental measurements described in Section 7.5.2. For the Lower Sand/Gravel Aquifer, it is not necessary to collect water levels east of Yale/Elk Chattaroy Road or south of Wahoo Road. Additionally, water level measurements at well clusters can be limited to wells screened in the C2 zone.

6. Make further adjustments (if needed) based on the results of the flow line analysis. The measured response to the initial adjustment should be used as a basis for selecting the magnitude of subsequent adjustments.

7. Repeat the process described in steps 1 through 6 until the desired adjustment is achieved.

It is recommended that a hydrogeologist perform or supervise the flow line analysis, and be consulted prior to implementation of any subsequent operational adjustments. The flow line analysis, and data associated with any associated operational adjustments, should be incorporated into the quarterly status report that addresses the period in which the activities were performed. These reports are the format for informing EPA and Ecology of extraction system performance (including "fine tuning" adjustments) and, as such, sufficient information must be incorporated to provide the regulatory agencies a basis for assessing the appropriateness and adequacy of the analysis and associated adjustments (if any).

It is recommended that aquifer response to operational adjustments be retained and compiled as additional data are generated. Data should include extraction well level adjustment, change in extraction rate resulting from adjustment, change in water level (or elevation) at monitored observation wells in response to adjustment. After a number of adjustments have been made, it should be possible for the operator to predict aquifer response to adjustments in the extraction system with reasonable accuracy.

7.5 AQUIFER MONITORING REQUIREMENTS

Aquifer monitoring requirements include the water quality monitoring requirements specified by the Consent Decree or required for operational purposes, and the groundwater elevation data needed to evaluate whether the South and West Interception Systems are achieving adequate drawdowns to demonstrate hydraulic control. Specific water quality monitoring requirements are

fully described in the Field Sampling Plan (Appendix F) and the Quality Assurance Project Plan (Section 8.0). Groundwater elevation monitoring requirements are described in Section 7.5.2.

7.5.1 WATER QUALITY MONITORING

Downgradient and outboard compliance monitoring wells are to be sampled and analyzed for the four indicator compounds (TCA, DCA, DCE, and TCE) of the six Constituents of Concern identified in Table 7-3. Outboard monitoring wells and downgradient monitoring wells (following the first 2 years of monthly sampling, which has already been completed) must be sampled and analyzed for the four indicator compounds quarterly for at least 3 years. All six Constituents of Concern must be analyzed for annually, for at least the first 5 years of operation. After 3 years of quarterly monitoring, the project consent decree allows a reduction in sampling frequency, and ultimately cessation of monitoring if adjustment control criteria are not exceeded.

Compliance monitoring wells have been identified for the RA. The compliance monitoring system for the South Interception System consists of four downgradient monitoring wells (CD-31A, CD-36A, CD-37A, and CD-38A) and two outboard monitoring wells (CD-34A and CP-S3). The downgradient compliance monitoring system for the West Interception System consists of 18 wells at six locations (a three-well cluster at each location; CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48). The consent decree further specifies that these six monitoring locations for the West Interception System be subdivided into two groups (Set A and Set B) and identifies different performance criteria for each set of monitoring wells (see SOW, Section V, for additional description of Sets A and B performance criteria). The outboard monitoring system for the West Interception System consists of the six wells at two of the downgradient compliance monitoring locations (CD-45 and CD-48). The South and West Systems compliance monitoring wells are identified in Table 7-11, and the well locations are shown on Figure 7-5.

7.5.2 GROUNDWATER ELEVATION MONITORING

Groundwater elevation monitoring is needed to evaluate whether the extraction system is achieving hydraulic control and to periodically evaluate the regional impact of the RA on groundwater levels. It is important to recognize that evaluation of hydraulic control based on groundwater elevations is a secondary basis for evaluating system performance, and that the ultimate

determination of adequate system performance will be based on achieving the concentration-based criteria specified in the Consent Decree. Groundwater elevations should be measured monthly for the monitoring wells identified in Table 7-4 for at least the first three years of RA operation, except that only wells screened in the C2 zone should be monitored for well clusters completed in the Lower Sand/Gravel Aquifer. Monthly groundwater elevation measurements should be compared to elevations compiled for the most recent supplemental quarterly water level measurement round used to perform the flow line analysis discussed in Section 7.4.2 to track changes in aquifer hydraulic conditions. In general, monthly monitoring is intended for tracking aquifer response to pumping and seasonal recharge conditions. However, if significant changes in groundwater elevation are observed (greater than about 1 ft), and these changes are not the result of the extraction system being off-line, implementation of a supplemental flow line analysis should be considered. If system adjustment is needed, based on the results of the supplemental flow line analysis, the procedures identified in Section 7.4.2 to implement system operational adjustment should be followed.

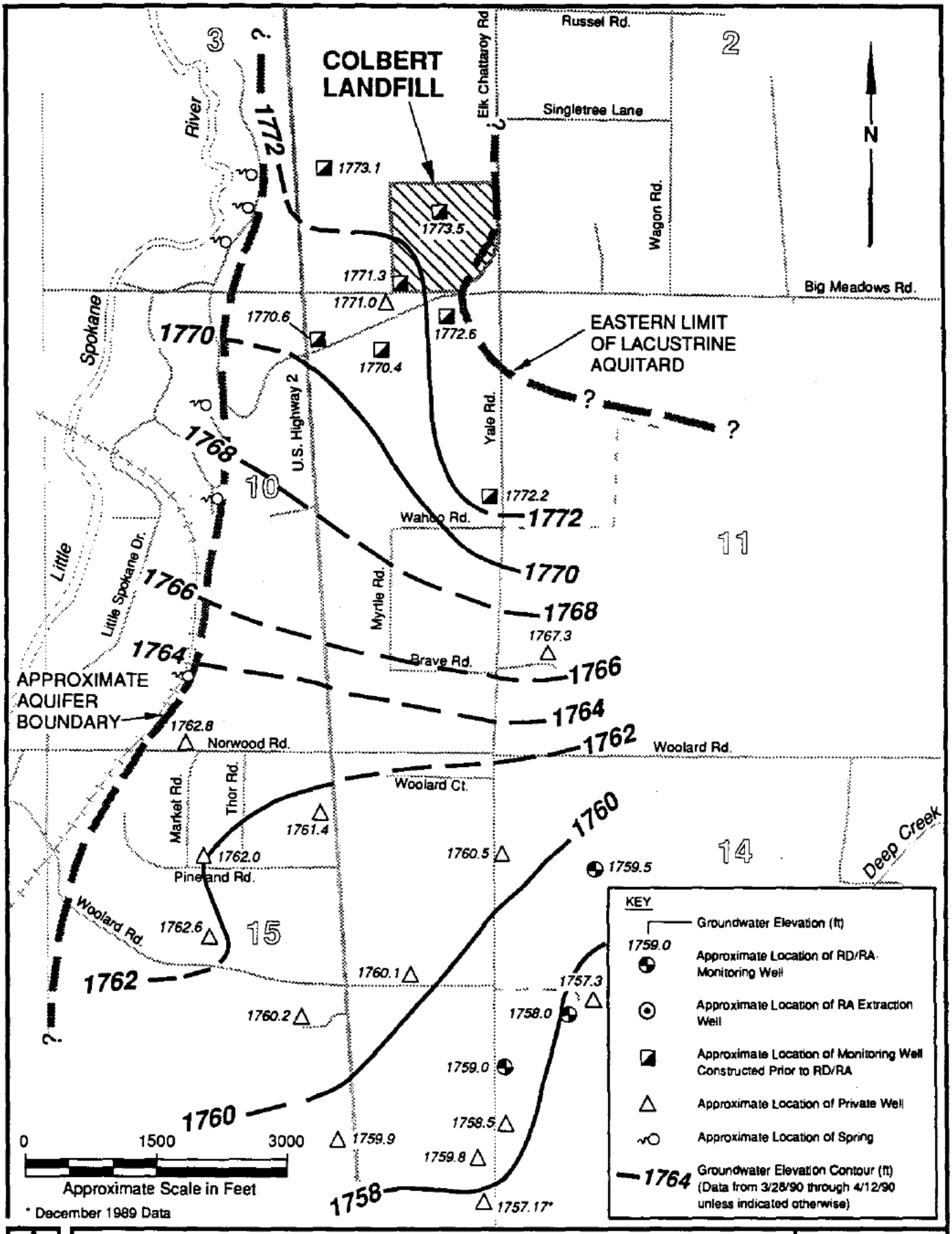
It is recommended that more extensive water level measurements be collected periodically, and drawdown estimated, to evaluate the regional impact of the RA. Tables 7-12 and 7-13 provide reference elevations and approximate prepumping groundwater elevations for wells screened in the Upper and Lower Aquifers, respectively. The locations of these wells are shown on Figures 7-17 and 7-18 for the Upper and Lower Aquifers, respectively. Water levels should be collected from these wells to provide the data needed for the flow line analysis described in Section 7.4.2 and for assessing the regional impact of the RA. It is recommended that measurements be collected, and regional drawdown be evaluated, quarterly for at least the first 4 years of RA operation. The frequency of future measurements should be determined based on the results of this initial 4-year monitoring effort.

7.6 SYSTEM ADJUSTMENT/MODIFICATIONS

As previously described, it may be necessary to adjust the interception/extraction systems to optimize hydraulic performance, and procedures for these operational adjustments are described in this O & M plan. However, if extraction system adjustment or modification is needed because of exceedence of the groundwater quality criteria specified in the project consent decree (and

described in Section 7.3 of this plan), or if an adjustment of greater than about ±50 percent of the model-predicted pumping rate is required, for system optimization (based on flow-line analysis) additional evaluation should be performed prior to preceding with the adjustment or modification. The nature and scope of the additional evaluation(s) required to address these conditions will be dependent on the specific condition encountered, and cannot be identified at this time.

If additional evaluation indicates that interception/ extraction system modification is needed to optimize operation hydraulic performance or to achieve consent decree performance requirements, modifications may consist of installation of higher capacity pumps in existing wells, or the construction of new extraction wells. These system modifications would require additional engineering design. Implementation of detailed hydrogeologic analysis or system adjustment or modification beyond that described in Section 7.4.2, is beyond the scope of this O & M plan. If operational conditions are encountered that indicate these actions may be warranted, the operator should inform the Spokane County project manager of the situation. It will then be the project manager's responsibility, in conjunction with EPA and Ecology, to determine appropriate further actions.



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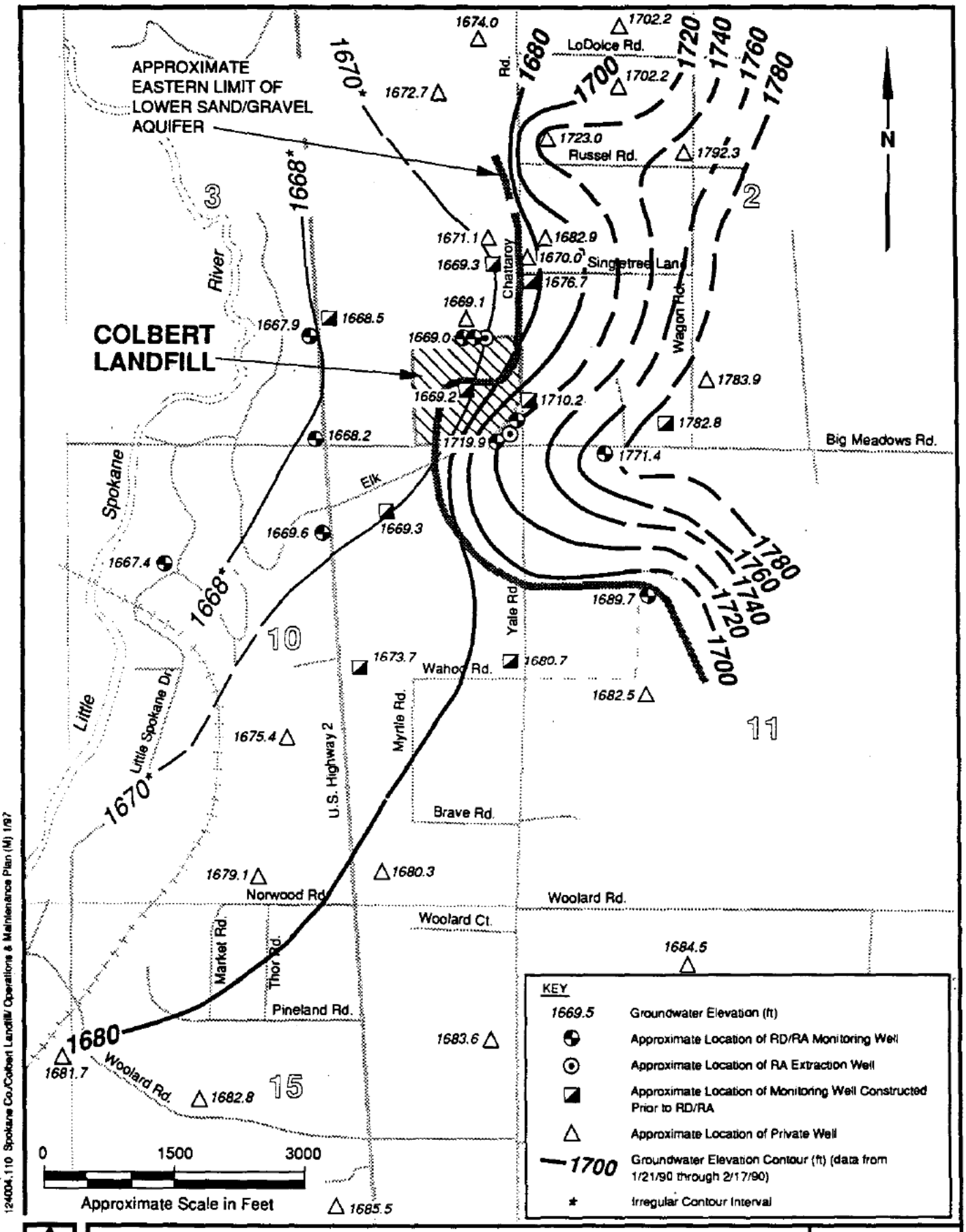
Upper Sand/Gravel Aquifer
Pre RA Groundwater Elevation Contours

Figure 7-1



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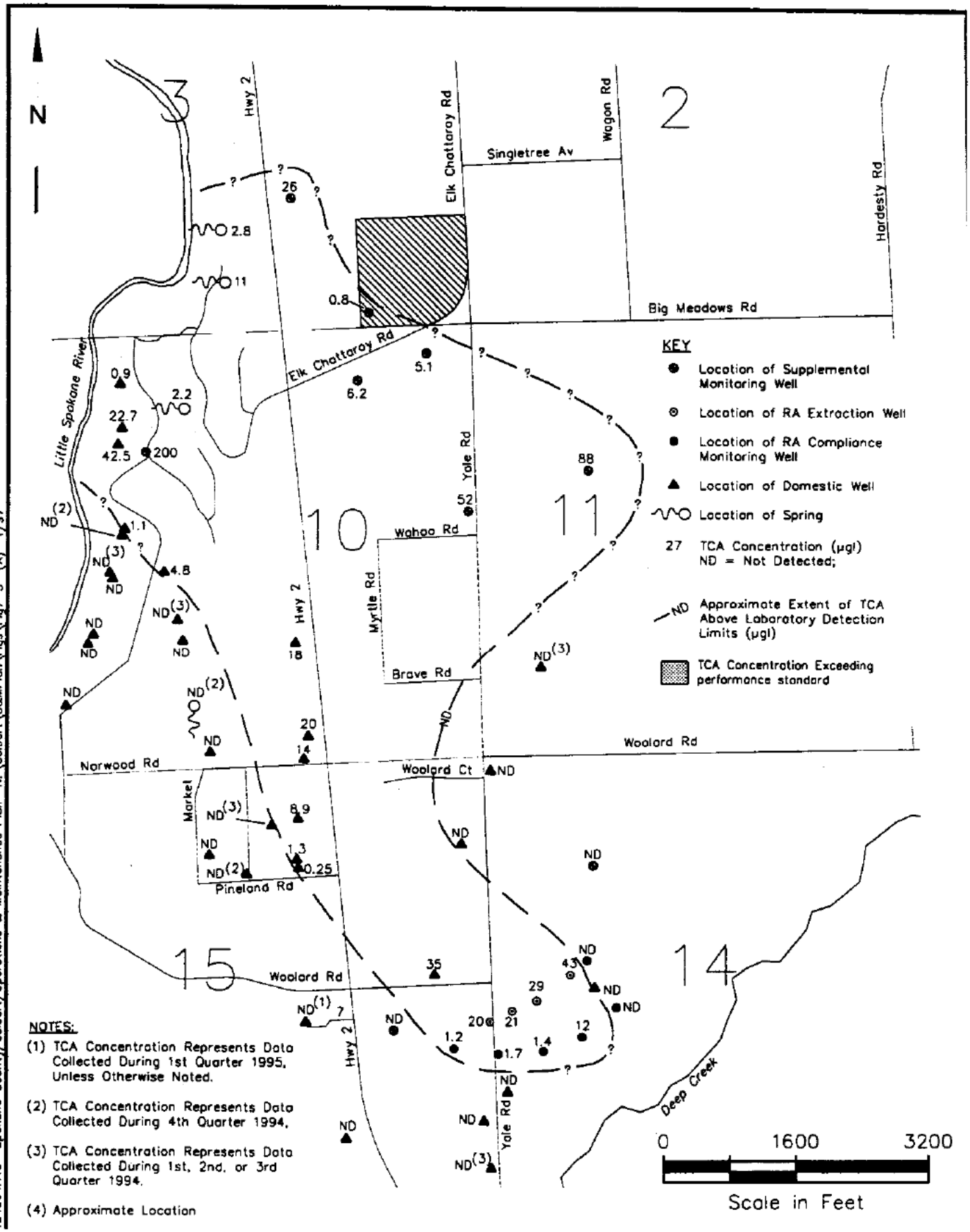
Lower Aquifers
Pre RA Groundwater Elevation Contours

Figure 7-2



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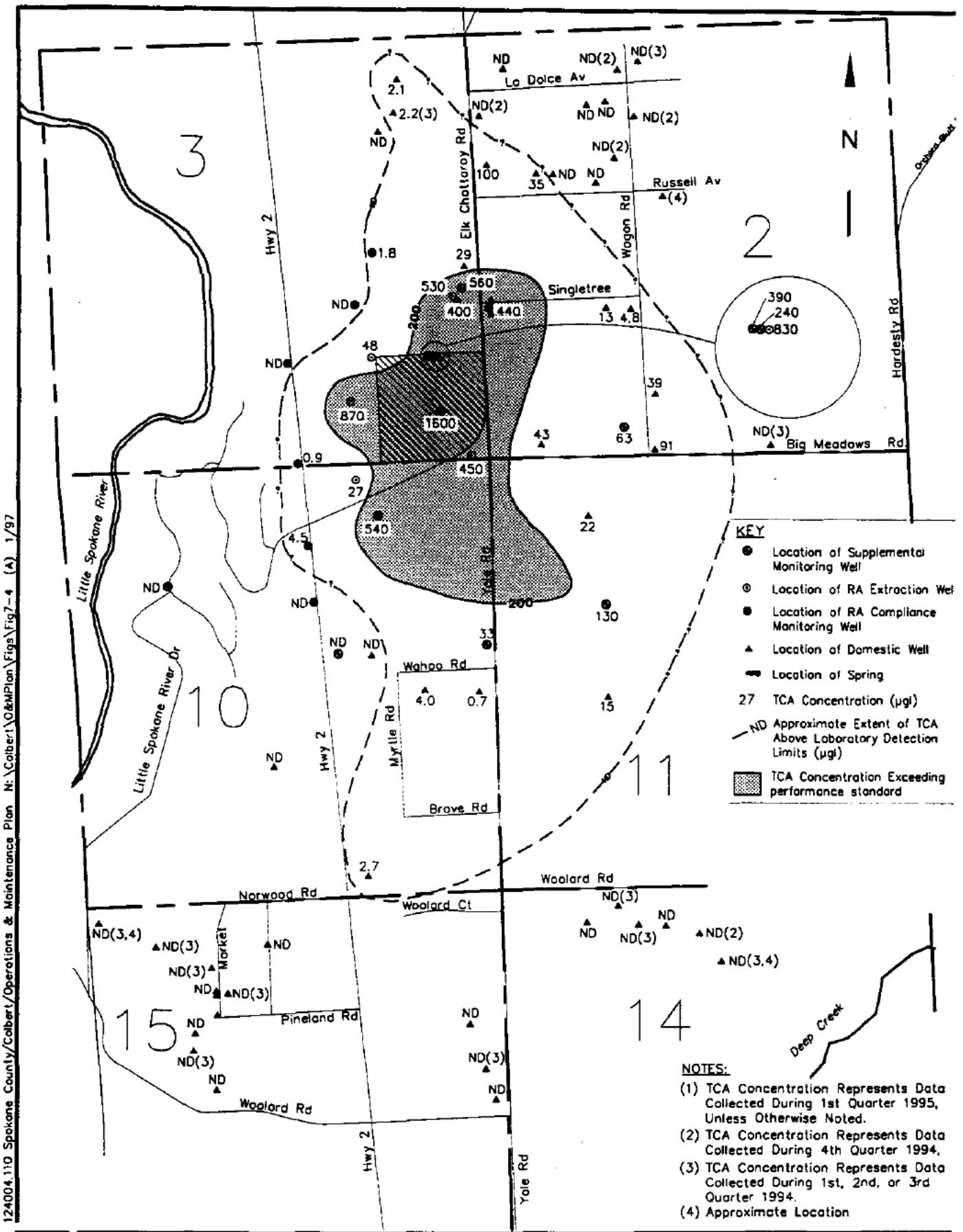
Upper Aquifers
Approximate Extent of TCA 1994/1995

Figure 7-3



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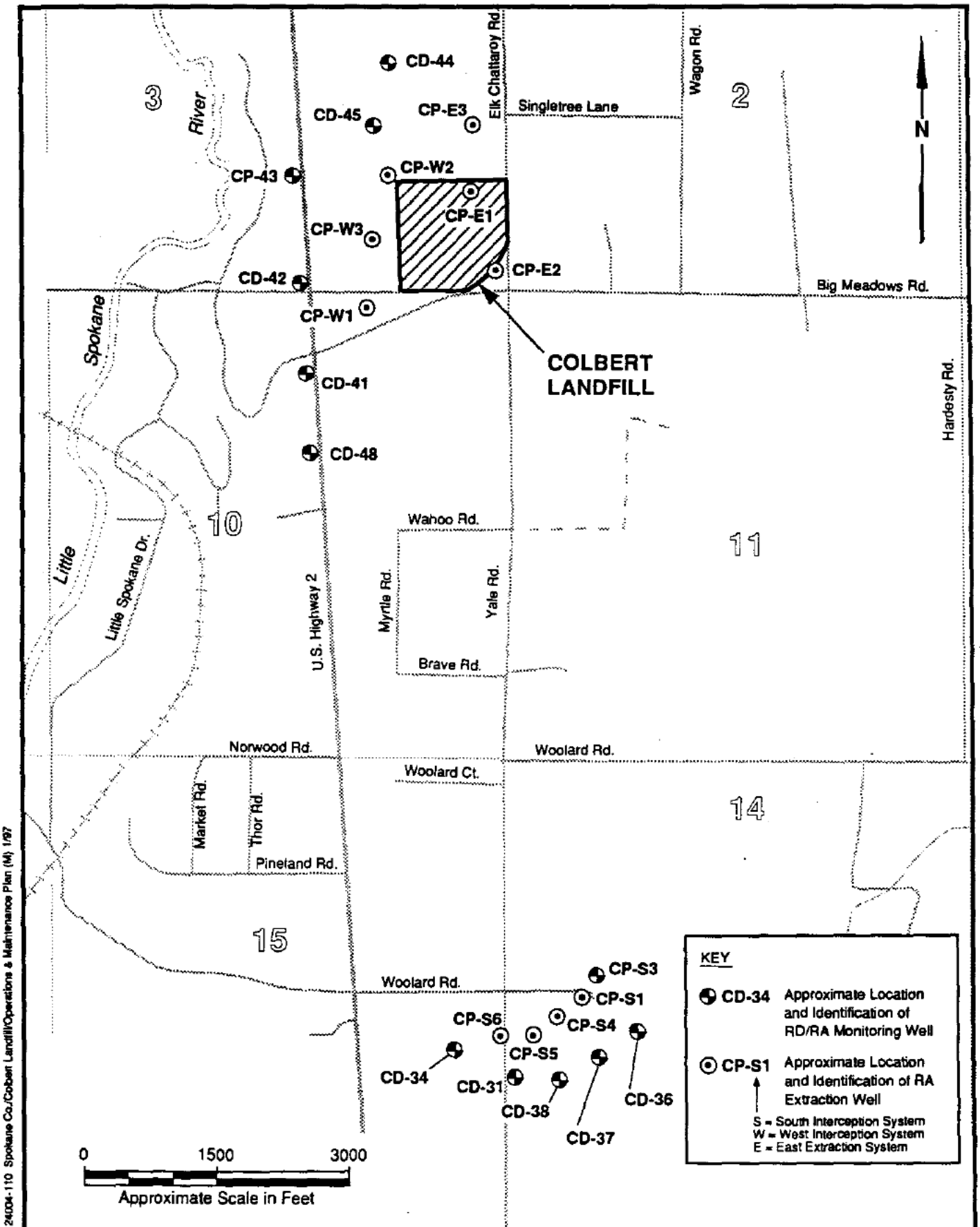
Lower Aquifers
Approximate Extent of TCA 1994/1995

Figure 7-4



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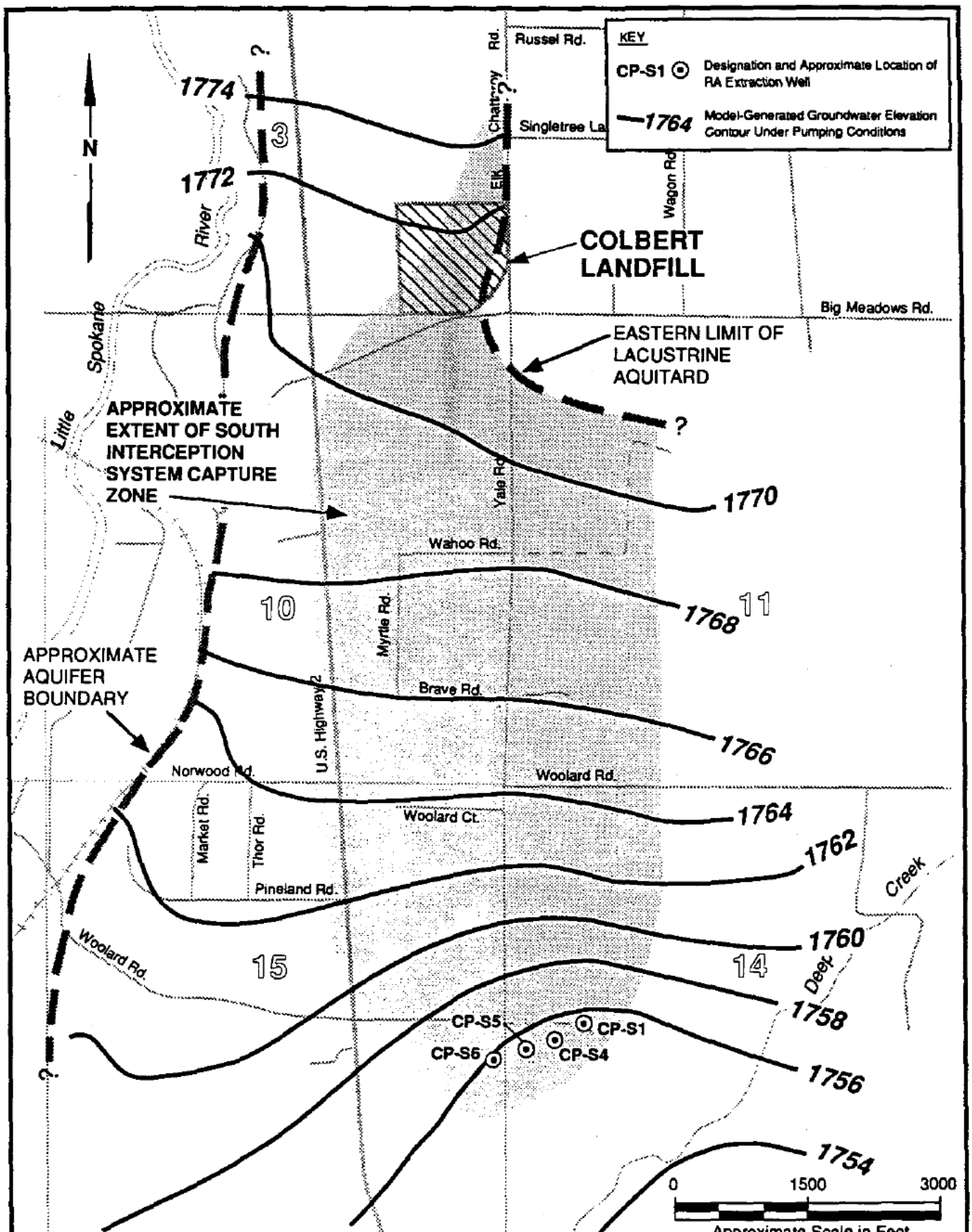
Extraction and Compliance Monitoring Well Location Map

Figure 7-5



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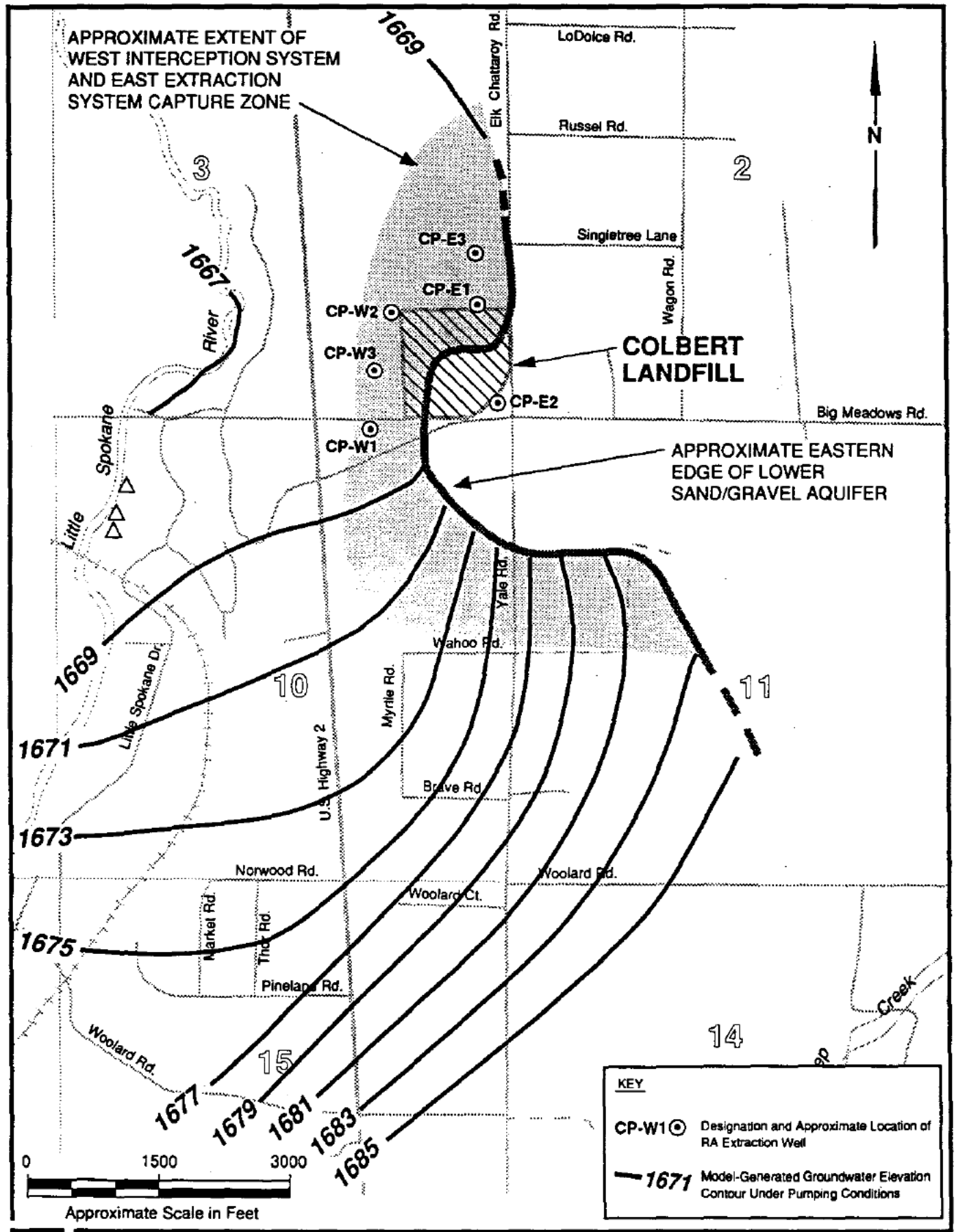
Model-Predicted South Interception System Capture Zone | Figure 7-6



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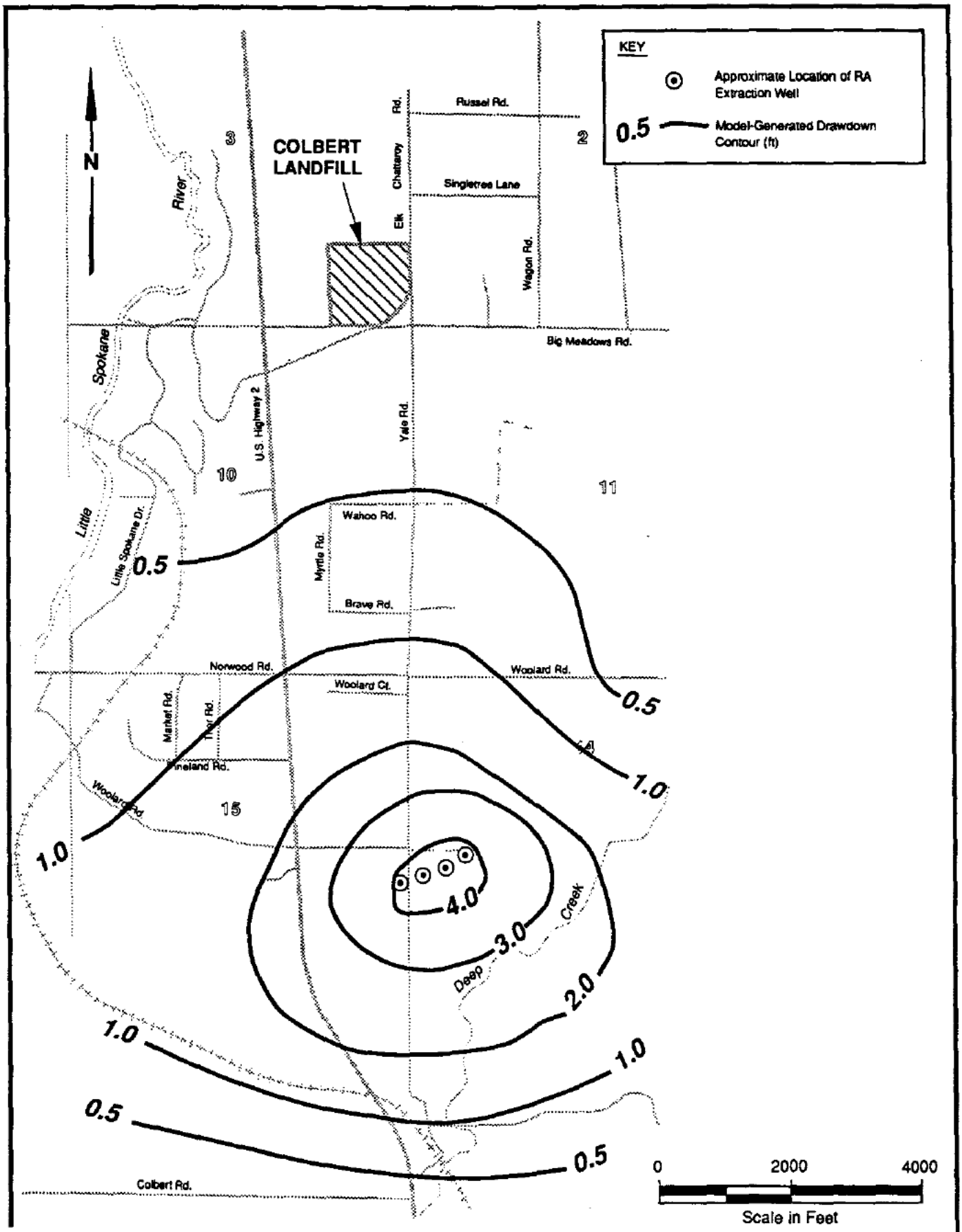
Model-Predicted West Interception and East Extraction System Capture Zone

Figure 7-7



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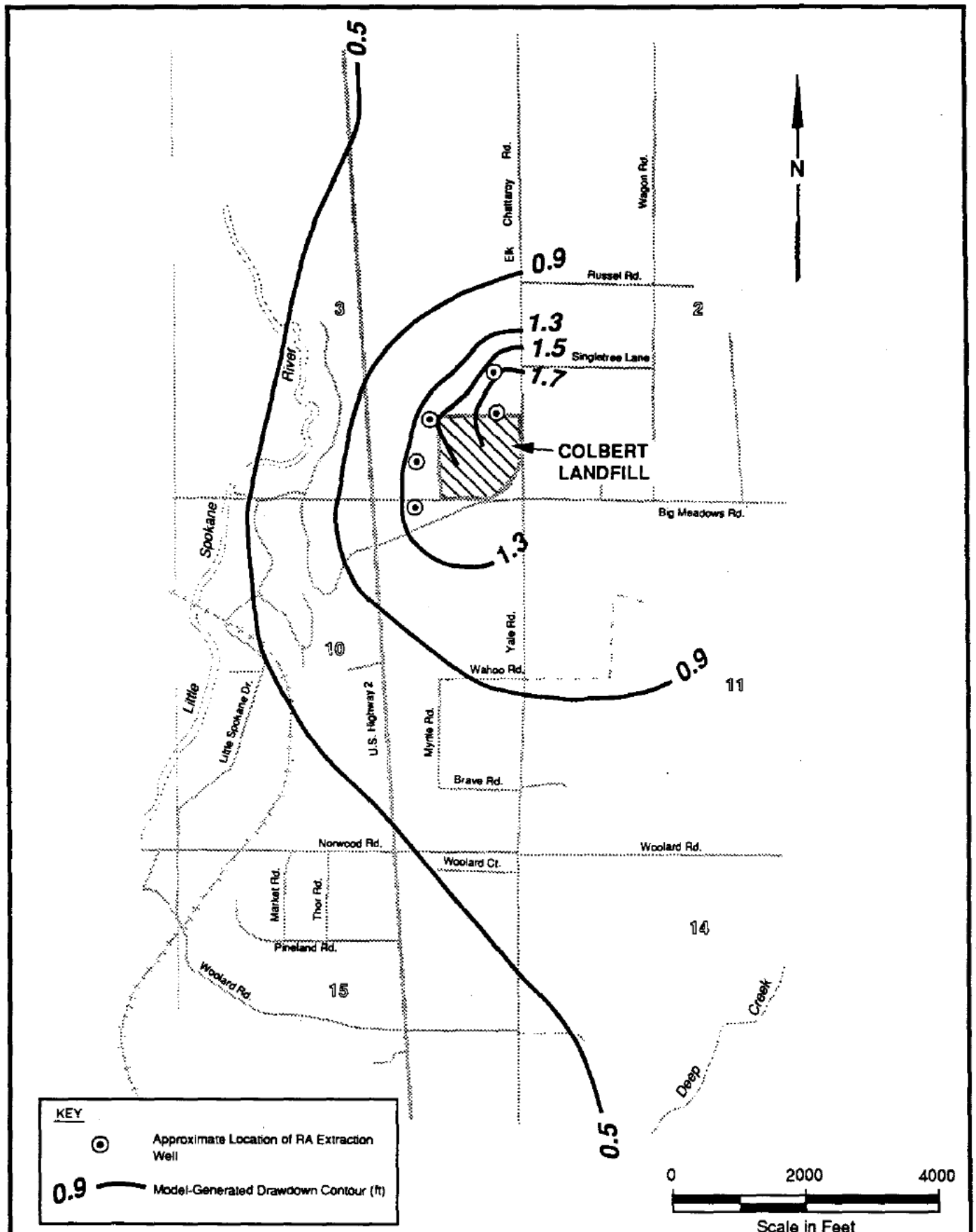
Upper Sand/Gravel Aquifer
Anticipated Regional Drawdown

Figure 7-8



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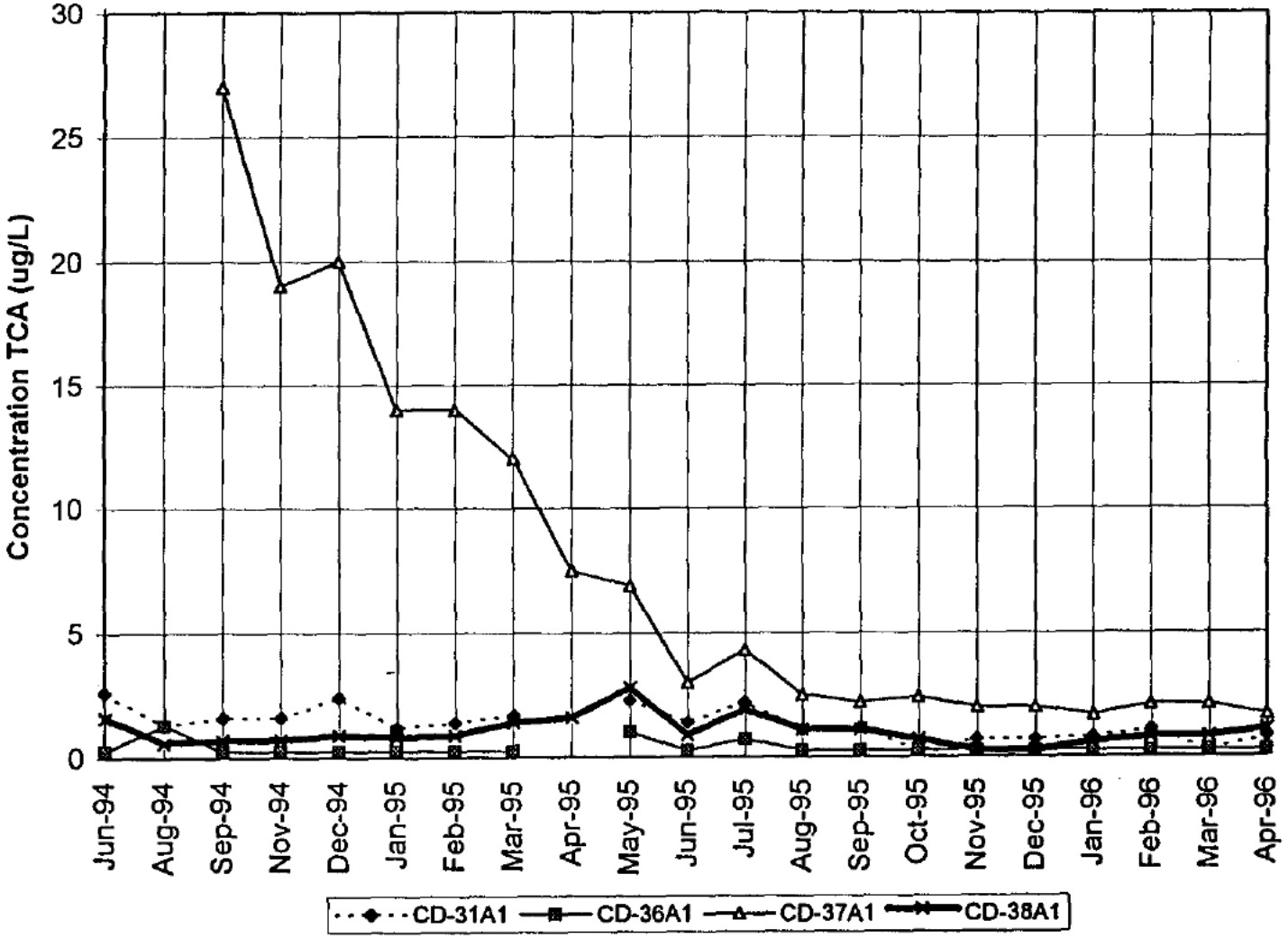
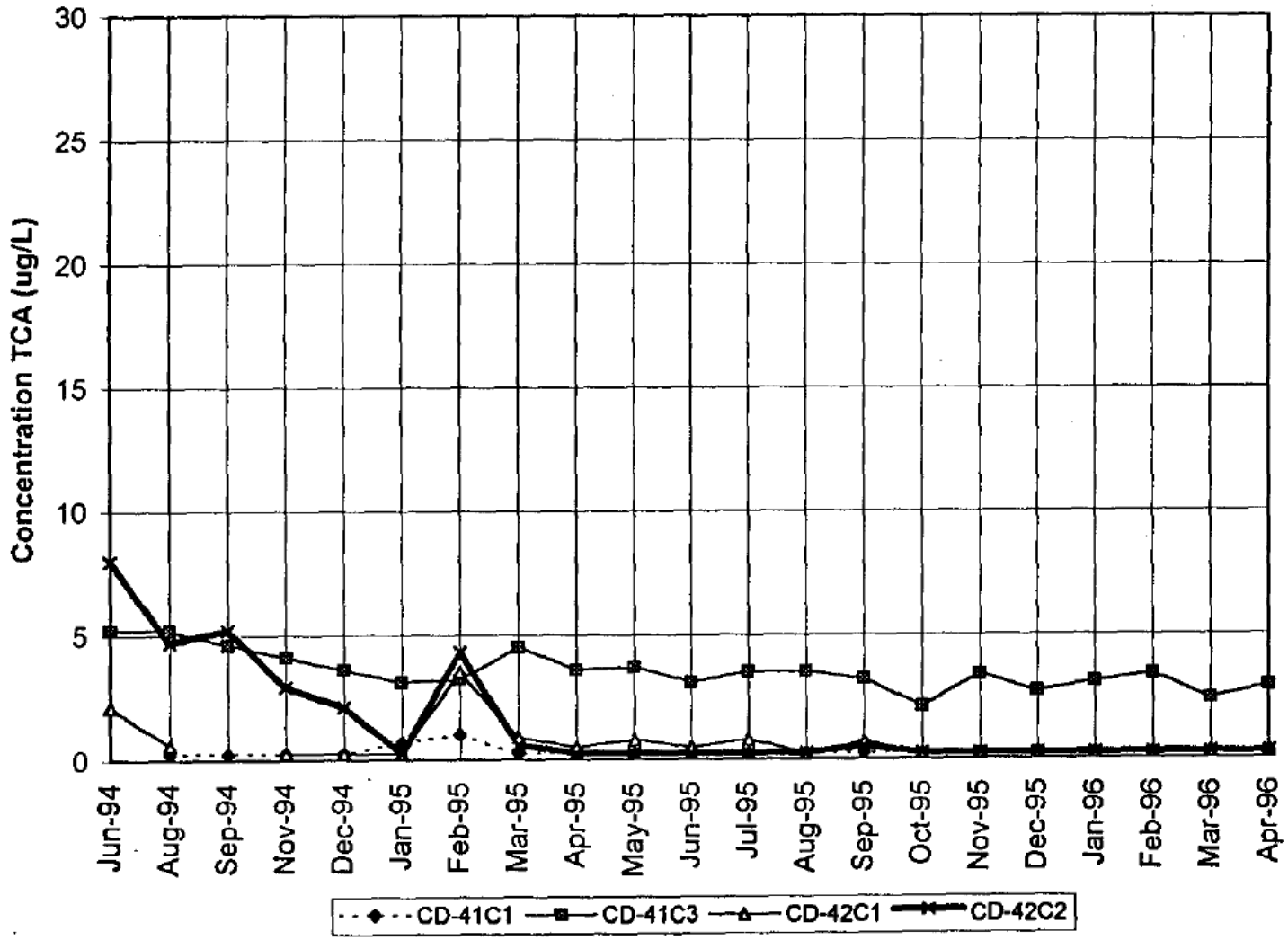
Lower Sand/Gravel Aquifer
Anticipated Regional Drawdown

Figure 7-9



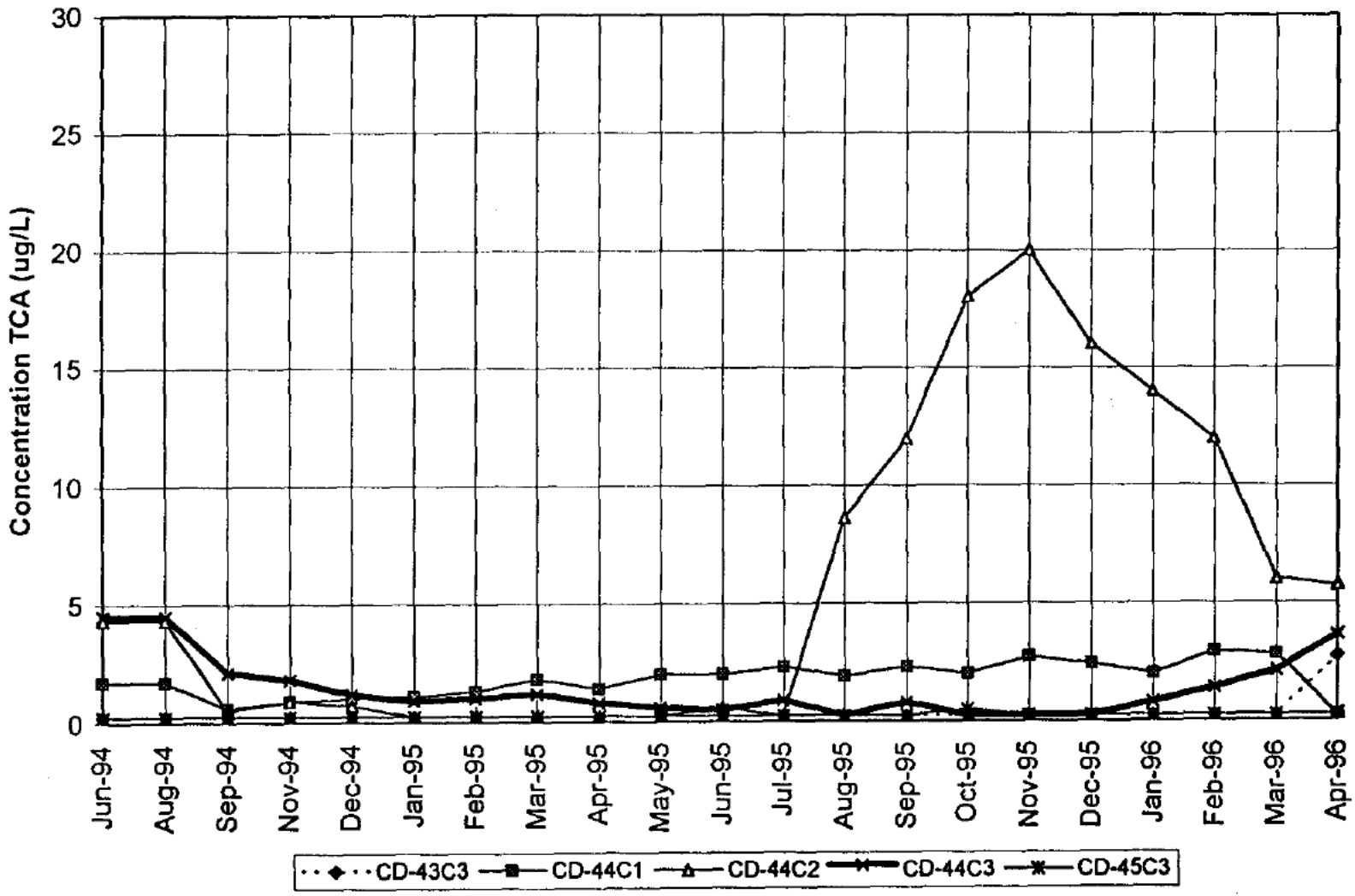
TCA Concentrations for Upper Sand/Gravel Aquifer
Downgradient Compliance Monitoring Wells

Figure 7-10



TCA Concentrations for Lower Sand/Gravel Aquifer (Set A)
Downgradient Compliance Monitoring Wells

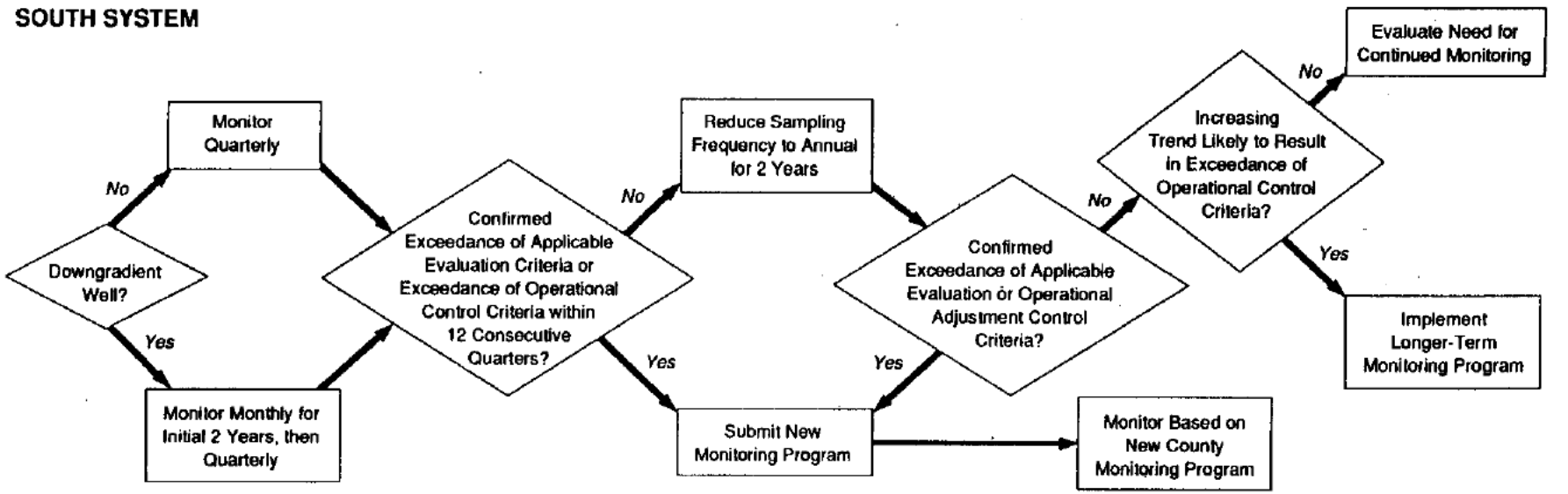
Figure 7-11



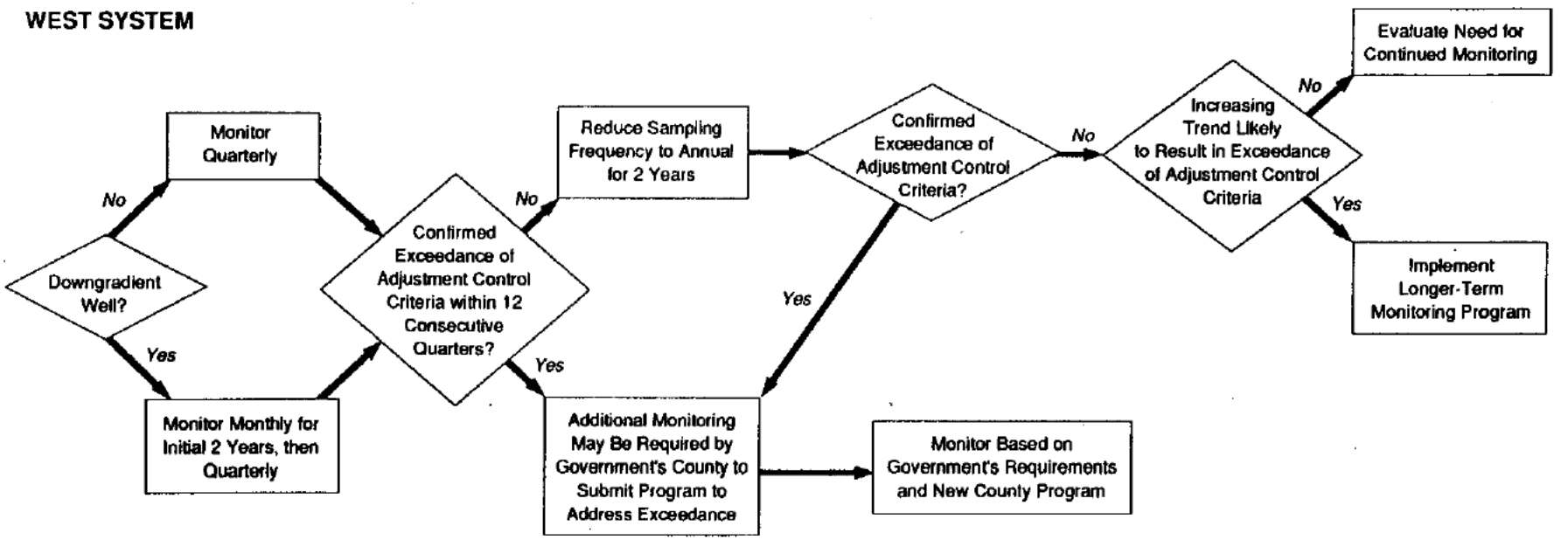
TCA Concentrations for Lower Sand/Gravel Aquifer (Set B)
Downgradient Compliance Monitoring Wells

Figure 7-12

SOUTH SYSTEM

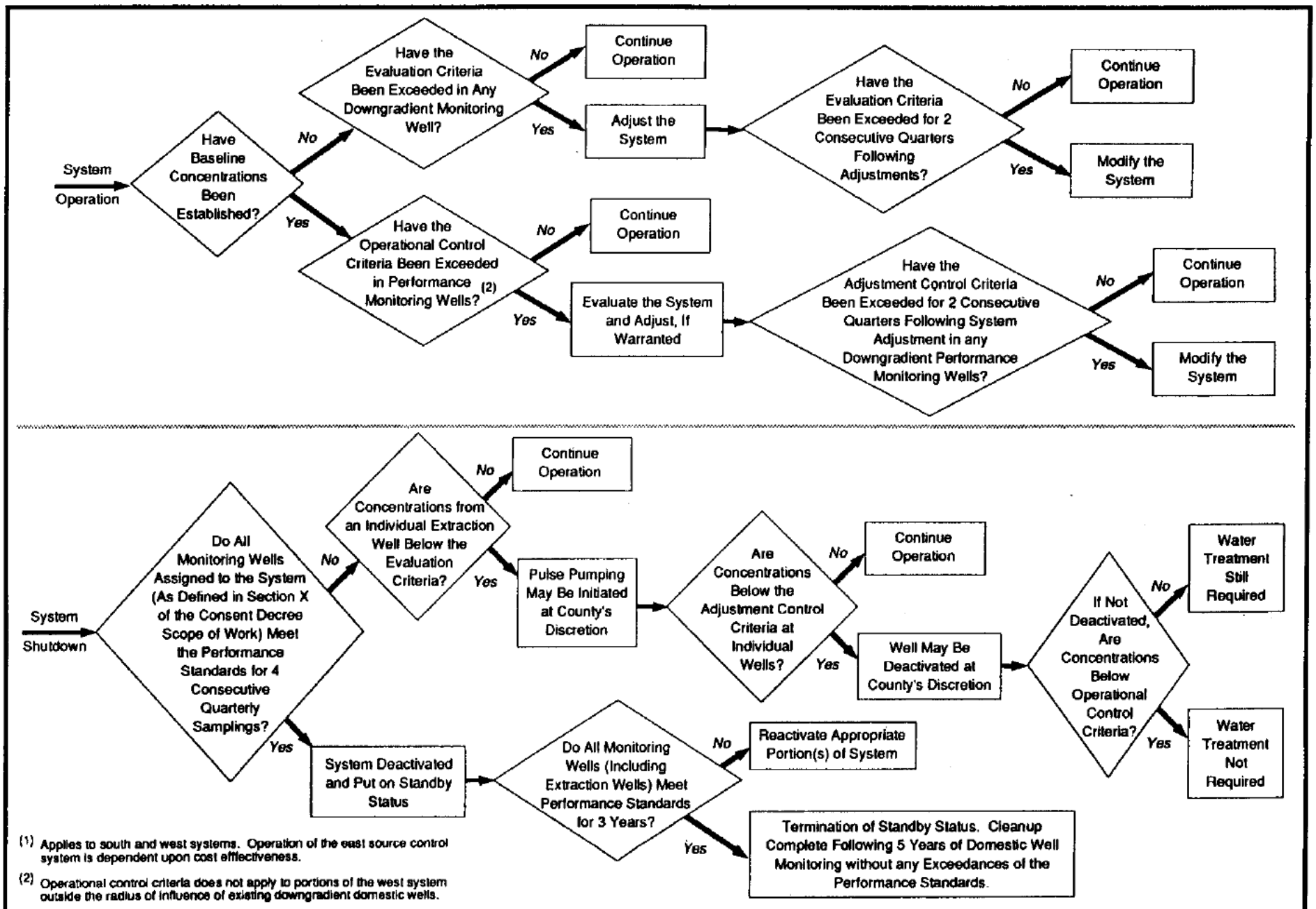


WEST SYSTEM



RA Interception System Monitoring Criteria

Figure 7-13

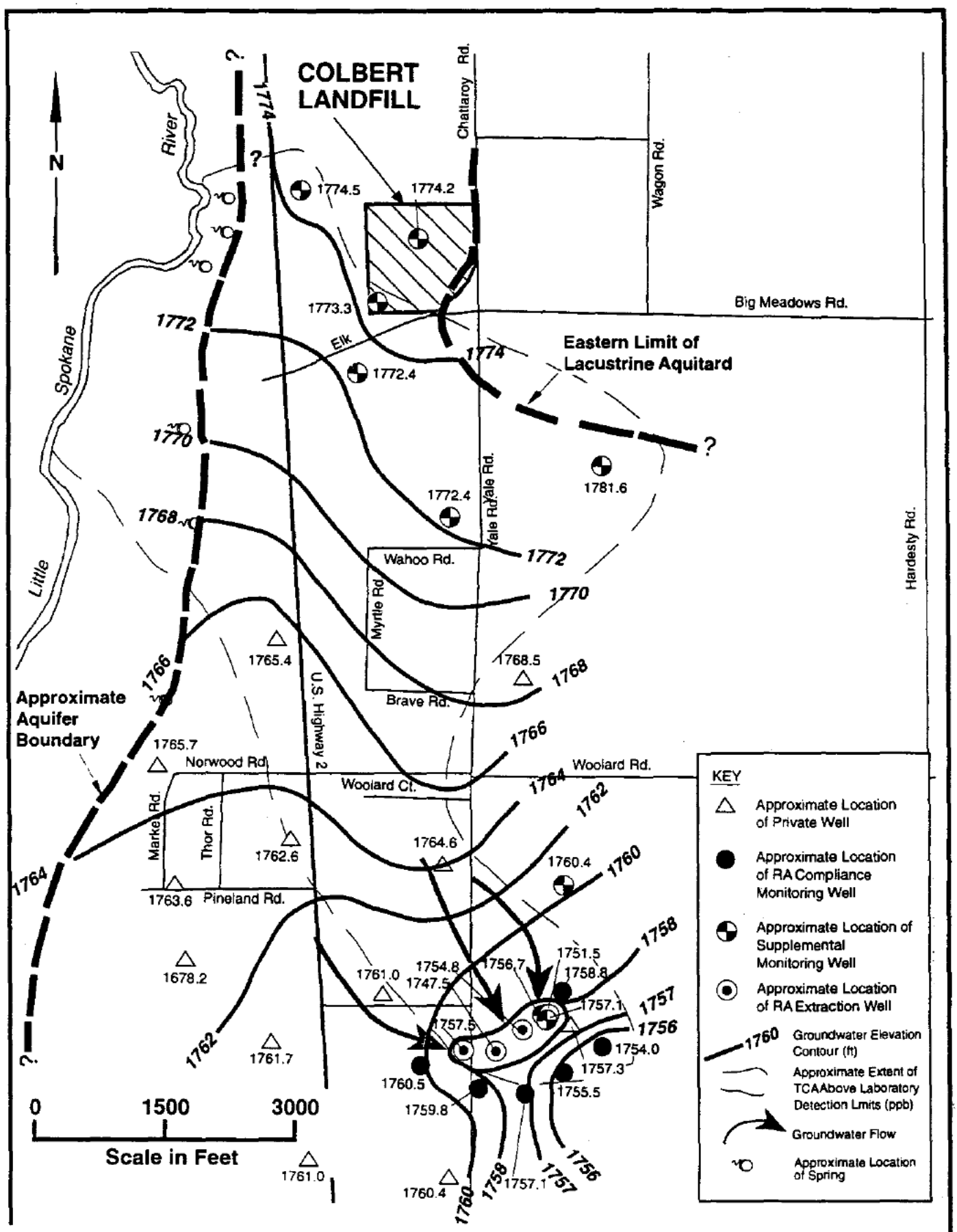


(1) Applies to south and west systems. Operation of the east source control system is dependent upon cost effectiveness.

(2) Operational control criteria does not apply to portions of the west system outside the radius of influence of existing downgradient domestic wells.

RA Interception System Operation and Shutdown Criteria[1]

Figure 7-14



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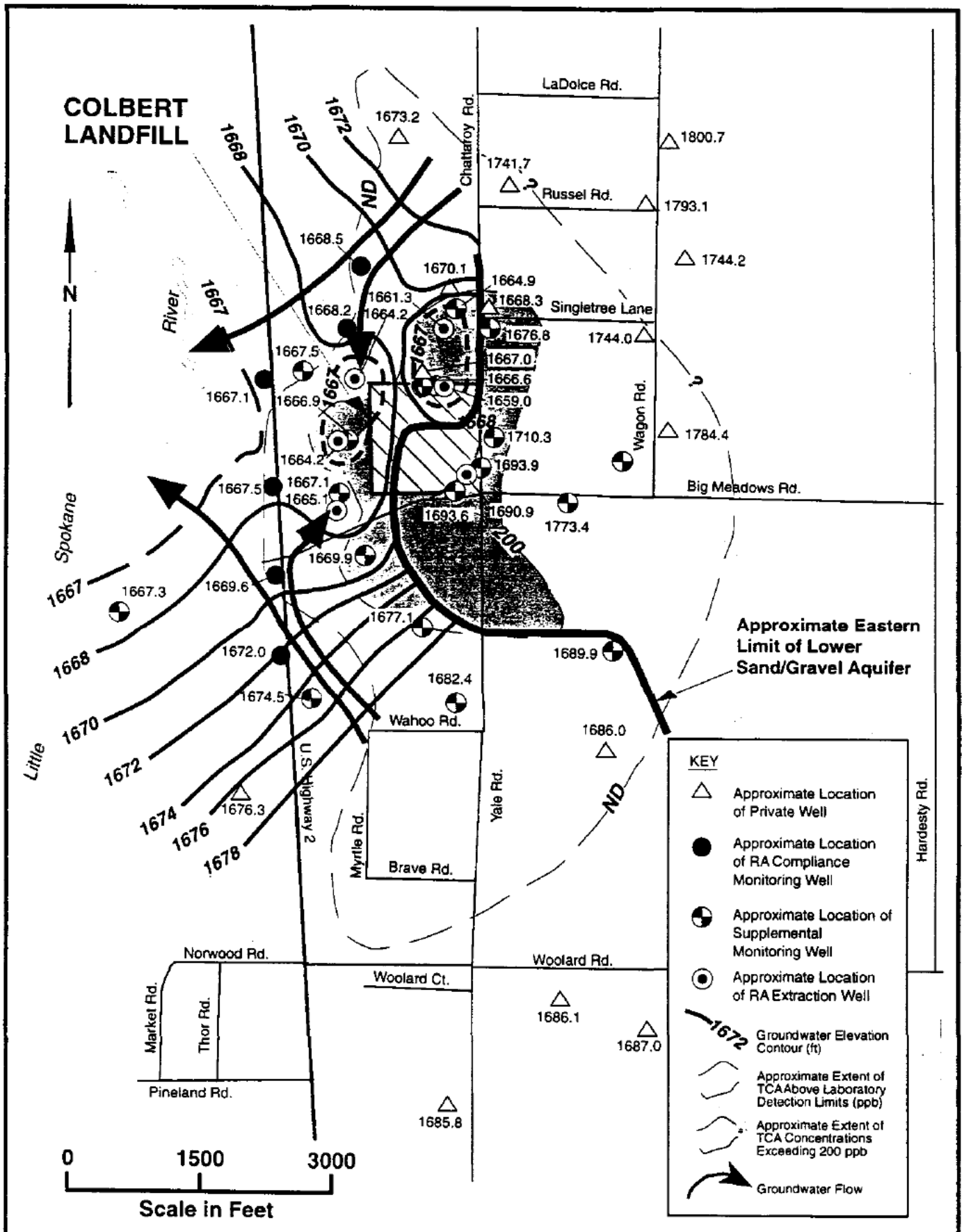
Upper Aquifers
Groundwater Elevation Contours October 1996 (Pumping)

Figure 7-15



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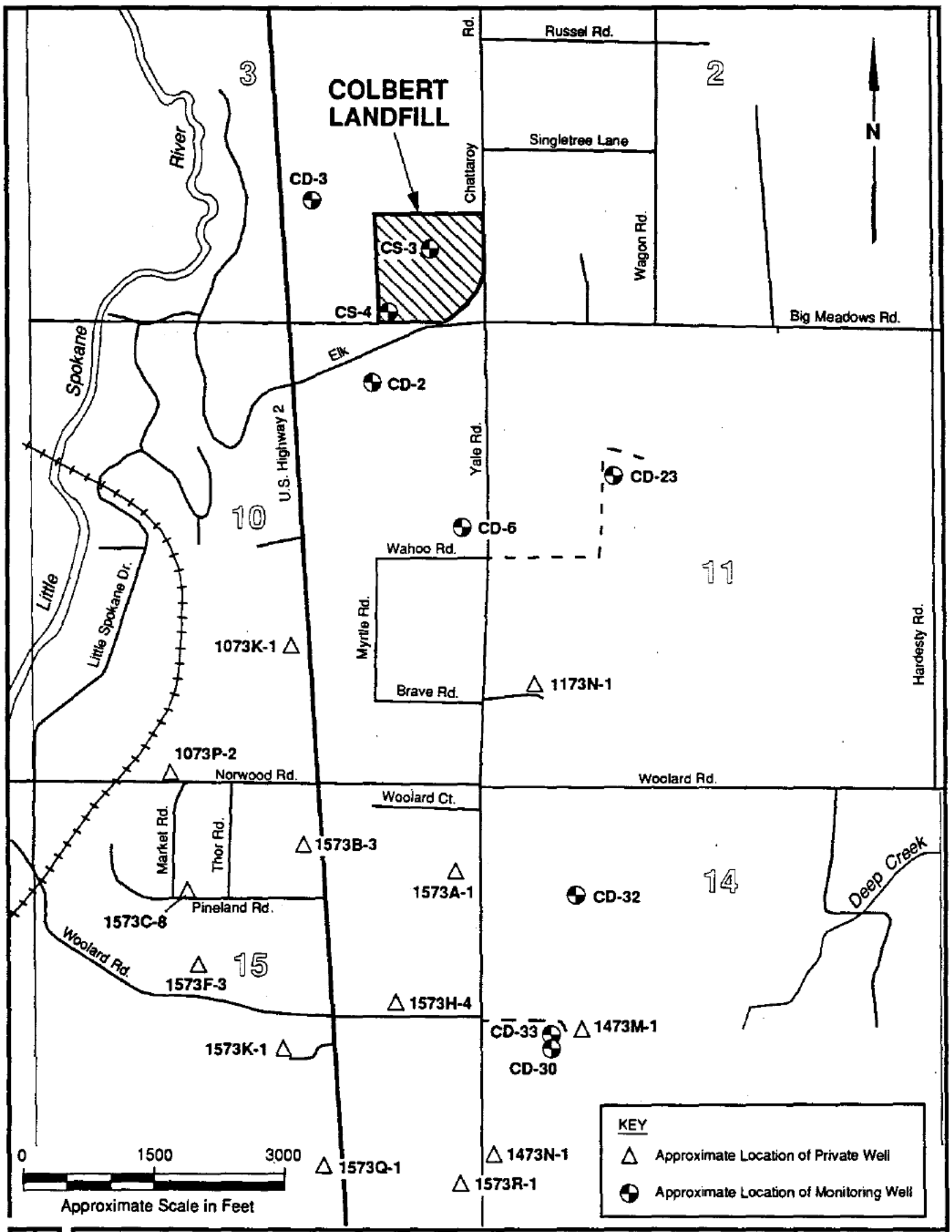
Lower Aquifers
Groundwater Elevation Contours October 1996 (Pumping)

Figure 7-16



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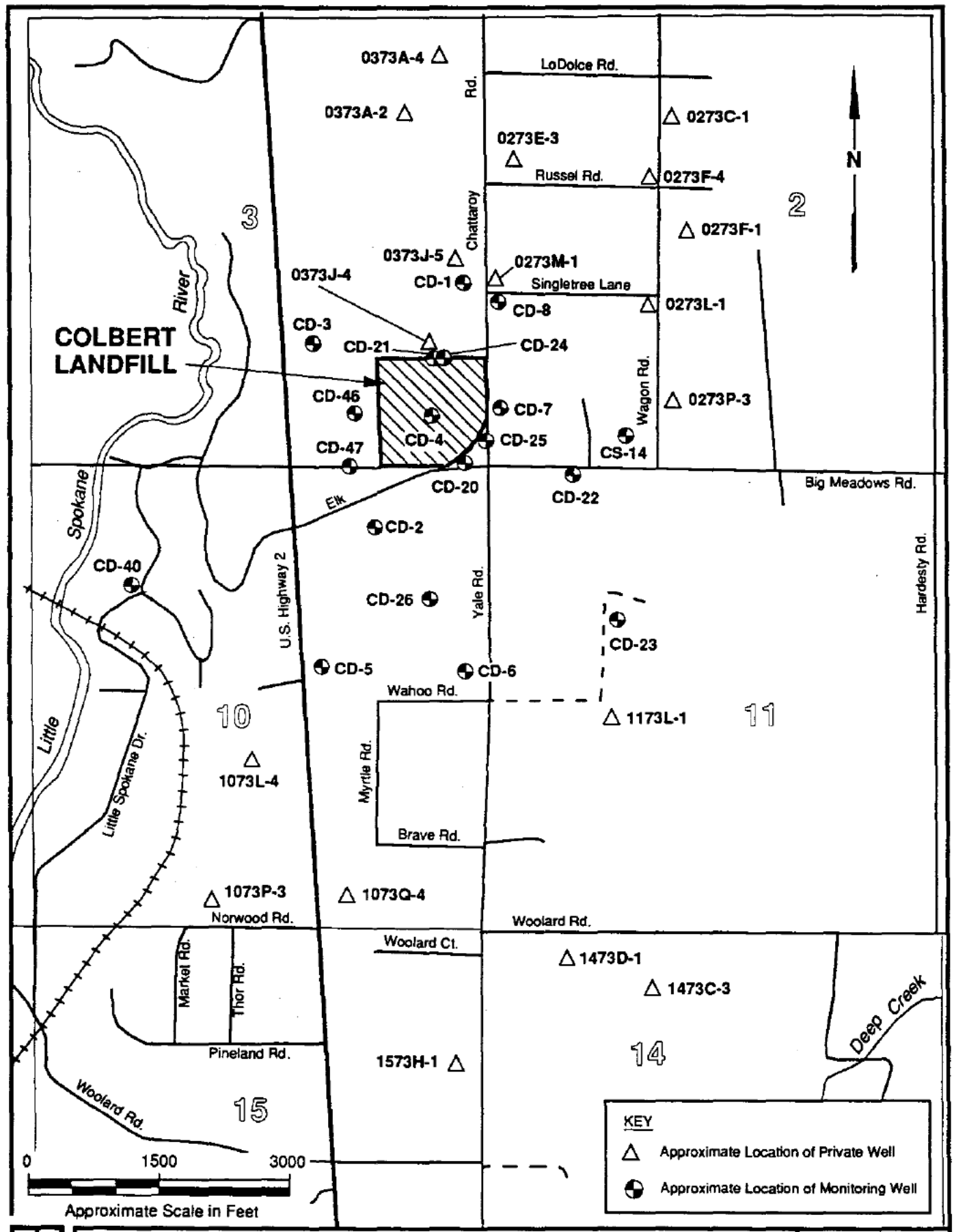
Upper Aquifers
Private Well and Monitoring Well Location Map

Figure 7-17



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Lower Aquifers
Private Well and Monitoring Well Location Map

Figure 7-18

TABLE 7-1

DESIGN FLOW RATES
RA INTERCEPTION AND EXTRACTION SYSTEMS[a]

Interception/ Extraction System	Extraction Well Designation	Model-Predicted		System Design	
		Lower Bound Flow Rate	Upper Bound Flow Rate	Minimum Flow Rate	Maximum Flow Rate
South	CP-S1	50	60	--	--
	CP-S4	50	60	--	--
	CP-S5	50	50	--	--
	CP-S6	50	60	--	--
Subtotal		200	230	200	400
West	CP-W1	80	170	--	--
	CP-W2	70	130	--	--
	CP-W3	120	230	--	--
Subtotal		270	530	250	900
East	CP-E1[b]	60	80	--	--
	CP-E2[c]	5	5	--	--
	CP-E3[b]	50	65	--	--
	CP-E4[b]	50	65	--	--
Subtotal		165	215	150	300
System Total		635	975	600	1,600

(a) Flow rates in gallons per minute (gpm).

(b) Flow rates predicted to assist West Interception System capture. Higher flow rates may be utilized for source control.

(c) Well not in model domain. Pumping rate based on Phase I pumping test results.

TABLE 7-2

WATER ELEVATION AND DRAWDOWN INFORMATION FOR RA EXTRACTION WELLS

Location	Approximate Prepumping Water Elevation[a] (ft)	Minimum Water Elevation[b] (ft)	Model-Predicted Drawdown	Maximum Available Drawdown[c] (ft)
West System				
CP-W1	1668.8	1582	4.2	87
CP-W2	1668.8	1611	2.4	58
CP-W3	1668.7	1624	3.0	45
South System				
CP-S1	1758.3	1744	6.4	14
CP-S4	1758.9	1750	6.4	9
CP-S5	1757.5	1749	6.1	8
CP-S6	1757.8	1749	6.2	9
East System				
CP-E1	1669.0	1635	3.6	34
CP-E2	1716.2	1686	NA[d]	30
CP-E3	1669.1	1645	3.6	24

(a) Water elevations from June 1993.

(b) Minimum water elevation based on depth to top of pump.

(c) Maximum allowable drawdown = approximate prepumping water elevation - minimum water elevation.

(d) Well is not located within model domain. Well should be pumped at the rate necessary to achieve maximum available drawdown.

TABLE 7-3

PROJECT CONCENTRATION-BASED CRITERIA[a]

Constituent of Concern	Performance Standards	Evaluation Criteria
1,1,1-Trichloroethane (TCA)	200	200
1,1-Dichloroethylene (DCE)	7	7
1,1-Dichloroethane (DCA)	4,050	4,050
Trichloroethylene (TCE)	5	5
Tetrachloroethylene (PCE)	0.7	7
Methylene chloride (MC)	2.5	25

(a) All concentrations in parts per billion (ug/L).

TABLE 7-4

TCA CONCENTRATIONS FOR POST RA STARTUP
TWO YEAR MONTHLY MONITORING PERIOD [a]

Monitoring Well	Aquifer [b]	Jun-94	Aug-94	Sep-94	Nov-94	Dec-94	Jan-95	Feb-95	Mar-95	Apr-95	May-95	Jun-95	Jul-95	Aug-95	Sep-95	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96
CD-31A1	upper	2.6	1.3	1.6	1.6	2.4	1.2	1.4	1.7		2.3	1.4	2.2	1.1	1.2	0.5 U	0.7	0.7	0.8	1.1	0.5 U	0.8
CD-36A1	upper	0.5 U	1.3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		1	0.5 U	0.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-37A1	upper	33		27	19	20	14	14	12	7.5	6.9	3	4.3	2.5	2.2	2.4	2	2	1.7	2.1	2.1	1.7
CD-38A1	upper	1.6	0.6	0.7	0.7	0.9	0.8	0.9	1.4	1.6	2.8	0.9	1.9	1.1	1.1	0.7	0.5 U	0.5 U	0.6	0.8	0.8	1.1
CD-41C1	lower A		0.5 U	0.5 U	0.5 U	0.5 U	0.7	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C3	lower A	5.2	5.2	4.6	4.1	3.6	3.1	3.2	4.5	3.6	3.7	3.1	3.5	3.5	3.2	2.1	3.4	2.7	3.1	3.4	2.4	2.9
CD-42C1	lower A	2.1	0.6		0.5 U	0.5 U	0.5 U	3.5	0.9	0.5	0.8	0.5	0.8	0.5 U	0.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C2	lower A	8	4.7	5.2	2.9	2.1	0.5 U	4.3	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C1	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.7
CD-44C1	lower B	1.7	1.7	0.6	0.9	1	1.1	1.3	1.8	1.4	2	2	2.3	1.9	2.3	2	2.7	2.4	2	2.9	2.8	0.5 U
CD-44C2	lower B	4.3	4.3	0.5	0.9	0.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.6	0.5 U	8.6	12	18	20	16	14	12	6	5.7
CD-44C3	lower B	4.5	4.5	2.1	1.8	1.2	0.9	1	1.2	0.8	0.6	0.5	0.9	0.5 U	0.8	0.5 U	0.5 U	0.5 U	0.8	1.4	2.1	3.6
CD-45C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

(a) All concentrations in ug/L.

(b) upper = Upper Sand/Gravel Aquifer
lower A = Set A, Lower Sand/Gravel Aquifer
lower B = Set B, Lower Sand/Gravel Aquifer

TABLE 7-5

DCA CONCENTRATIONS FOR POST RA STARTUP TWO YEAR MONTHLY MONITORING PERIOD [a]

Monitoring Well	Aquifer [b]	Jun-94	Aug-94	Sep-94	Nov-94	Dec-94	Jan-95	Feb-95	Mar-95	Apr-95	May-95	Jun-95	Jul-95	Aug-95	Sep-95	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96
CD-31A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-36A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-37A1	upper	1.3		1.1	0.5 U	0.9	0.7	0.8	0.8	0.8	0.8	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-38A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C1	lower A		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C1	lower A	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C1	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

(a) All concentrations in ug/L.

(b) upper = Upper Sand/Gravel Aquifer
lower A = Set A, Lower Sand/Gravel Aquifer
lower B = Set B, Lower Sand/Gravel Aquifer

TABLE 7-6

DCE CONCENTRATIONS FOR POST RA STARTUP TWO YEAR MONTHLY MONITORING PERIOD [a]

Monitoring Well	Aquifer [b]	Jun-94	Aug-94	Sep-94	Nov-94	Dec-94	Jan-95	Feb-95	Mar-95	Apr-95	May-95	Jun-95	Jul-95	Aug-95	Sep-95	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96
CD-31A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-36A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-37A1	upper	1.7		2.5	1	1.4	0.8	0.8	0.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-38A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C1	lower A		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C1	lower A	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C1	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

(a) All concentrations in ug/L.

(b) upper = Upper Sand/Gravel Aquifer
lower A = Set A, Lower Sand/Gravel Aquifer
lower B = Set B, Lower Sand/Gravel Aquifer

TABLE 7-7

TCE CONCENTRATIONS FOR POST RA STARTUP
TWO YEAR MONTHLY MONITORING PERIOD [a]

Monitoring Well	Aquifer [b]	Jun-94	Aug-94	Sep-94	Nov-94	Dec-94	Jan-95	Feb-95	Mar-95	Apr-95	May-95	Jun-95	Jul-95	Aug-95	Sep-95	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96
CD-31A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-36A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-37A1	upper	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-38A1	upper	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C1	lower A		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-41C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C1	lower A	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-42C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C1	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C2	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-48C3	lower A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-43C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-44C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C1	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C2	lower B	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CD-45C3	lower B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

(a) All concentrations in ug/L.

(b) upper = Upper Sand/Gravel Aquifer
lower A = Set A, Lower Sand/Gravel Aquifer
lower B = Set B, Lower Sand/Gravel Aquifer

TABLE 7-8

BASELINE CONCENTRATIONS, OPERATIONAL CONTROL CRITERIA AND ADJUSTMENT CONTROL CRITERIA FOR THE UPPER SAND/GRAVEL AQUIFER [a]

Indicator Compound	Baseline Concentration	PQL	Operational Control Criteria	Adjustment Control Criteria
TCA	2.6	0.3	33[b]	103[c]
DCA	0.31	0.7	610[b]	2026[c]
DCE	0.33	1.0	N/A	4.5[c]
TCE	0.26	1.0	N/A	3.3[d]

(a) All concentrations in ug/L

(b) Operational control criteria is based on 15 percent of the evaluation criteria, plus the baseline concentration or PQL (whichever is greater)

(c) Adjustment control criteria is based on 50 percent of the evaluation criteria, plus the baseline concentration or PQL (whichever is greater)

(d) Adjustment control criteria is based on 65 percent of the evaluation criteria

TABLE 7-9

BASELINE CONCENTRATIONS, OPERATIONAL CONTROL CRITERIA AND ADJUSTMENT CONTROL CRITERIA FOR THE LOWER SAND/GRAVEL AQUIFER [a]

Indicator Compound	Baseline Concentration	PQL	Operational Control Criteria	Adjustment Control Criteria
Set A Monitoring Wells				
TCA	0.75	0.3	31[b]	101[c]
DCA	0.25	0.7	610[b]	2026[c]
DCE	0.25	1.0	N/A	4.5[c]
TCE	0.25	1.0	N/A	3.3[d]
Set B Monitoring Wells				
TCA	1.2	0.3	NA	101[c]
DCA	0.25	0.7	N/A	2026[c]
DCE	0.25	1.0	N/A	4.5[c]
TCE	0.25	1.0	N/A	3.3[d]

(a) All concentrations in ug/L
(b) Operational control criteria is based on 15 percent of the evaluation criteria, plus the baseline concentration or PQL (whichever is greater)
(c) Adjustment control criteria is based on 50 percent of the evaluation criteria, plus the baseline concentration or PQL (whichever is greater)
(d) Adjustment control criteria is based on 65 percent of the evaluation criteria

TABLE 7-10

APPROXIMATE PREPUMPING GROUNDWATER ELEVATIONS AND PREDICTED DRAWDOWN FOR SELECTED MONITORING WELLS

Location	Approximate Prepumping Water Elevation (ft)[a]	Predicted Steady State Drawdown (ft)
Upper Sand/Gravel Aquifer		
CP-S3A	1758.7	3.2
CD-31A	1759.8	3.2
CD-34A	1760.3	2.9
CD-35A	1760.5	2.2
CD-36A	1754.1	2.8
CD-37A	1755.7	3.0
CD-38A	1757.2	3.1
Lower Sand/Gravel Aquifer		
CD-41C1	1669.6	0.8
CD-41C2	1669.6	0.8
CD-41C3	1669.7	0.8
CD-42C1	1668.4	1.1
CD-42C2	1668.2	1.1
CD-42C2	1668.4	1.1
CD-43C1	1667.6	1.0
CD-43C2	1667.9	1.0
CD-43C3	1668.8	1.0
CD-44C1	1669.7	1.0
CD-44C2	1669.7	1.0
CD-44C3	1669.6	1.0
CD-45C1	1669.1	1.3
CD-45C2	1669.1	1.3
CD-45C3	1669.1	1.3
CD-48C1	1671.4	0.6
CD-48C2	1671.3	0.6
CD-48C3	1671.2	0.6
CD-02C1	1669.1	1.2
CD-05C2	1673.7	0.5

(a) Based on April 1994 measurements.

TABLE 7-11

RA COMPLIANCE MONITORING WELLS

Monitoring System/Function	Monitoring Well Designation
West Monitoring System	
Downgradient - Set A	CD-41C1
	CD-41C2
	CD-41C3
	CD-42C1
	CD-42C2
	CD-42C3
	CD-48C1
	CD-48C2
	CD-48C3
Downgradient - Set B	CD-43C1
	CD-43C2
	CD-43C3
	CD-44C1
	CD-44C2
	CD-44C3
	CD-45C1
	CD-45C2
	CD-45C3
Outboard	CD-45C1
	CD-45C2
	CD-45C3
	CD-48C1
	CD-48C2
	CD-48C3
South Monitoring System	
Downgradient	CD-31A
	CD-36A
	CD-37A
	CD-38A
Outboard	CD-34A
	CP-S3

TABLE 7-12

SUPPLEMENTAL UPPER AQUIFER GROUNDWATER MONITORING AND PRIVATE WELLS FOR WATER LEVEL MEASUREMENTS

Well	Aquifer[a]	Reference Elevation[b] (MSL)	Groundwater Elevation[c] (MSL)
Monitoring Wells			
CD-2 S	A1	1853.87	1771.3[d]
CD-3 M	A1	1845.01	1773.3
CD-6 U	A1	1856.94	1772.4
CD-23	B1	1860.51	1781.6
CD-30	A1	1845.95	1758.1
CD-32	B1	1853.44	1759.8
CD-33	A1	1846.57	1758.1
CS-3	A1	1864.13	1774.6
CS-4	A1	1858.38	1771.8
CS-10	A1	1849.77	NA[e]
Private Wells			
1573R-1 (b) (6)	NA	1851.75	1759.9
1473N-1	NA	1844.62	NA
1473M-1	NA	1839.15	1757.4
1573H-4	NA	1856.95	NA
1573F-3	NA	1840.58	NA
1073P-2	NA	1838.67	1764.6
1573Q-1	NA	1839.13	1760.0
1173N-1	NA	1858.61	NA
1573K-1	NA	1850.33[f]	1760.4
1573B-3	NA	1844.66	1761.4
1573A-1	NA	1854.60	NA
1073K (b) (6)	A1	1843.74	1764.1
1573C-8 (b) (6)	NA	1841.13	1762.4

(a) A = Upper Sand/Gravel Aquifer; B = Lacustrine Aquitard; number represents relative position in the aquifer, with "1" near top, "2" in middle unit, and "3" near base.
(b) Reference elevation is top of PVC casing for monitoring wells and access port for private wells, unless otherwise indicated.
(c) Monitoring well data is from one measurement taken June 1993, unless otherwise noted.
(d) Data is from average of two measurements taken June 1993 and April 1994.
(e) NA = information not available.
(f) Surveyed at angled port access; 0.35 ft must be subtracted from the depth to water reading due to angled access.

TABLE 7-13

SUPPLEMENTAL LOWER AQUIFER GROUNDWATER MONITORING AND PRIVATE WELLS FOR WATER LEVEL MEASUREMENTS

Well	Aquifer[a]	Reference Elevation[b] (MSL)	Groundwater Elevation[c] (MSL)
Monitoring Wells			
CD-1	C2	1853.4[d]	1669.3
CD-2 D	C2	1853.93	1669.2[e]
CD-3 L	C1	1845.00	1668.3
CD-4 L	E1	1867.61	1669.2
CD-5	C2	1854.33	1673.7[e]
CD-6 L	C2	1861.60	1680.7
CD-7 L	E1	1866.94	1711.2
CD-8	E1	1866.76	1678.5
CD-8 L	E2	1866.74	1676.3
CD-20	E1	1864.58	1716.2
CD-20	E2	1865.00	1716.2
CD-21	C1	1855.88	1669.2[e]
CD-21	C3	1857.38	1669.4[e]
CD-22	D1	1865.35	1773.1
CD-23	C2	1861.08	1689.8
CD-24	C2	1859.85	1669.2[e]
CD-25	E2	1865.00	1714.8
CD-26	C2	1860.79	1675.9
CD-40	C1	1671.67	1661.4
CD-40	C2	1671.84	1667.2
CD-40	C3	1672.29	1663.4
CD-46	C2	1852.61	1668.4
CD-47	C2	1850.88	1668.8
CS-14U	C1	1868.25	1784.7
CS-14 L	D1	1868.19	1784.7

TABLE 7-13

SUPPLEMENTAL LOWER AQUIFER GROUNDWATER MONITORING AND PRIVATE WELLS FOR WATER LEVEL MEASUREMENTS

Well	Aquifer[a]	Reference Elevation[b] (MSL)	Groundwater Elevation[c] (MSL)
Private Wells			
0273L-1 (b) (6)	NA	1888.08	1732.9
1173L-1	NA	1855.33	1683.4
0273M-1	C/E/F	1867.69	1670.8
0273P-3	E1	1863.53	1785.2
1573H-1	NA	1851.55	1683.7
1073P-3	C1	1838.79	1679.0
0273F-4	NA	1884.75	NA
0273F-1	NA	1890.60	1743.5
0373A-2	NA	1837.21	1672.8
1473D-1	NA	1855.97	1683.8
0273E-3	C1	1889.09	1747.0
0373A-4	C1	1870.64	1674.7
1473C-3	C1	1848.50	1684.6
0373J-5	F1	1860.41	1670.8
0273C-1	F1	1887.69	1801.9
1073L-4	NA	1841.52	1675.4
0373J-4	NA	1890.17	1763.4

(a) C = Lower Sand/Gravel Aquifer; D = Latah Aquitard; E = Basalt Aquifer; F = Granite Aquitard; number represents relative position in the aquifer, with "1" near top, "2" in middle, and "3" near base.

(b) Reference elevation is top of PVC for monitoring wells and access port for private wells.

(c) Monitoring well data is from one measurement taken June 1993, unless otherwise noted.

(d) Reference point is top of steel casing.

(e) Data is from average of two measurements taken June 1993 and April 1994.